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A System for Rejuvenating Machine Tools

Outline of Methods Employed in Large Chicago Plant for Rebuilding Used Machines—Interesting Features of Shop Equipment

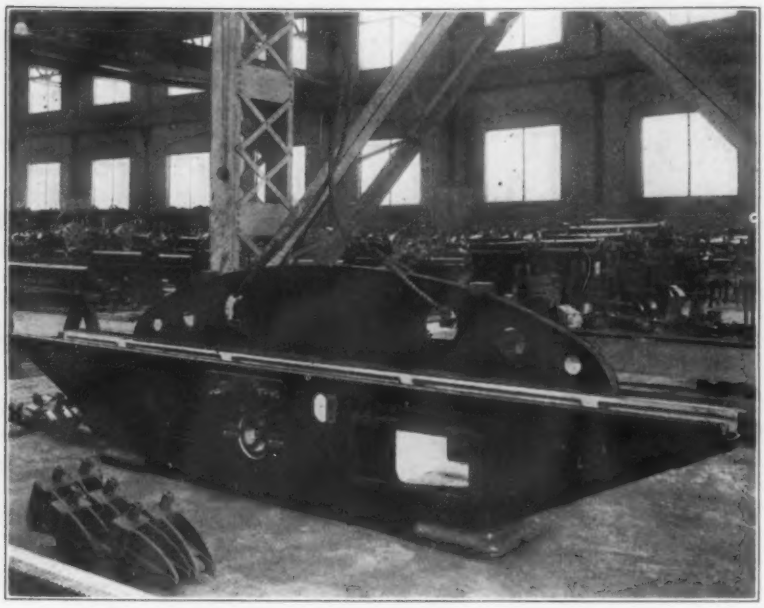
BECAUSE of the increasing difficulty in obtaining satisfactory deliveries of new machine tools, second-hand or used machines have taken a place of importance in the machinery field far beyond that of previous years, a situation which renders the following account of the system pursued by Hill, Clarke & Co. of Chicago, in rebuilding or "remanufacturing" such tools, of interest, not only to those who purchase them, but to buyers and sellers as well. The company's faith in its project of restoring, so far as possible, all the essential elements of a new machine is evidenced by its heavy investment in a large and well-equipped plant, with a roomy, light interior, on a site which leaves plenty of space for expansion as the need arises.

The methods to be described are the culmination of 15 years in handling second-hand tools; in other words, they are the result of steady development during that period of time, and based on the ripened judgment which experience alone gives. Before outlining the methods used, a survey of the shop and equipment will be given, and that these are well worth a visit is a conclusion reached by all who have accepted the company's invitation.

DETAILS OF SHOP CONSTRUCTION

In the Douglas Park section of Chicago, in which are situated some great industrial plants, such as those of the Western Electric Company and Joseph T. Ryerson & Sons, Hill, Clarke & Co. have in operation a plant designed by F. E. Davidson, industrial engineer and architect. The building is 160 x 360 ft., the floor space approximating that of Chicago's Coliseum. It is of brick and steel construction, and one story in height, with 40 ft. from floor to roof. Through the center of the building is a single row of steel columns, otherwise the entire area is unobstructed. Two 75-ft. span Pawling & Harnisch-

ngers for the Line Shaft Are Fastened to Pieces Which Are Clamped to I-Beams, the Strength of the Latter Being Unimpaired by Rivet or Bolt Holes and the Shaft Rendered Movable



Testing the Bed of a 16 x 96-In. Grinding Machine with a 10-Ft. Brown & Sharpe Straight Edge, the Machine Being in Course of Rebuilding. View also shows arrangement of windows and system of radiation

feger cranes traverse the length of the building, one being 40 tons capacity and the other 10 tons.

The roof slopes to the center of the structure. Placed laterally across the roof are eight skylights, each 65 ft. long. As shown in the accompanying illustrations the windows are in two parallel rows, the bottom of the lower row being 8 ft. from the floor; this arrangement has the triple effect of diffusing light throughout the shop, of preventing light from shining directly into the eyes of the workmen and allowing generous space for radiation. In some of the illustrations the coils of steam pipes operated on the vacuum system are conspicuous. It might also be observed that the high windows allow of greater safety from intruders at times when the shop is idle, and also lessen the likelihood of the employees' attention being unnecessarily distracted from their work. The skylights have steam coils around their bases, which obviate condensation on the glass as well as assisting in heating.

A switch from a belt-line railroad, which serves all the lines entering Chicago, enables a track to run through one end of the building. In this connection it should be noted that the large doors at the opposite end of the shop are of such height that any machine which is brought into the building on a flat car can be removed on a motor truck.

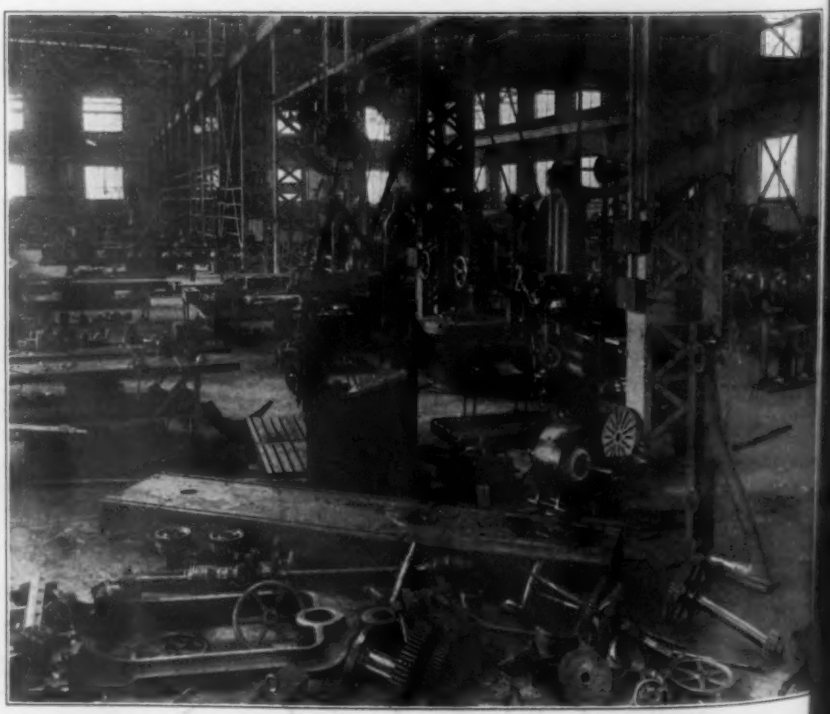
LINE-SHAFT SUPPORT CLAMPED TO I-BEAMS

Along one side of the building is a line shaft carrying power to lathes, gear-cutting, hobbing and buffing machines, etc., the supporting hangers of which are fastened to small steel pieces, which in turn are clamped to an I-beam. In the latter, therefore, are no holes to impair its strength, while an additional advantage is that the shaft can be moved at will, even to the extent of placing it on another wall if desired. In the center of the building is another shaft conveying power for operating working machines, though principally used for testing remanufactured tools. This shaft is bolted to channels which are carried by the columns. The floor of the shop is of cement with a top dressing of granite screenings, which is found less productive of dust. The shop benches are placed laterally across the shop, an arrangement which has been found satisfactory. They are movable and constructed of cast-iron legs with hard wood tops.

In a general way, it may be said that there are two methods of handling a used machine tool preparatory to again placing it on the market, one being merely to give it a good cleaning and make slight replacements; the second, to dismantle the machine entirely, scrutinize every part, plane and scrape bearing surfaces, replace worn parts, such as gears, bushings, screws, etc., polish, refinish, and then reassemble the machine and subject it to a running test, and it is doing all this which justifies the expression "remanufacturing," on which Hill, Clarke & Co. lay emphasis.

ADVANTAGE OF SPECIALISTS RECOGNIZED

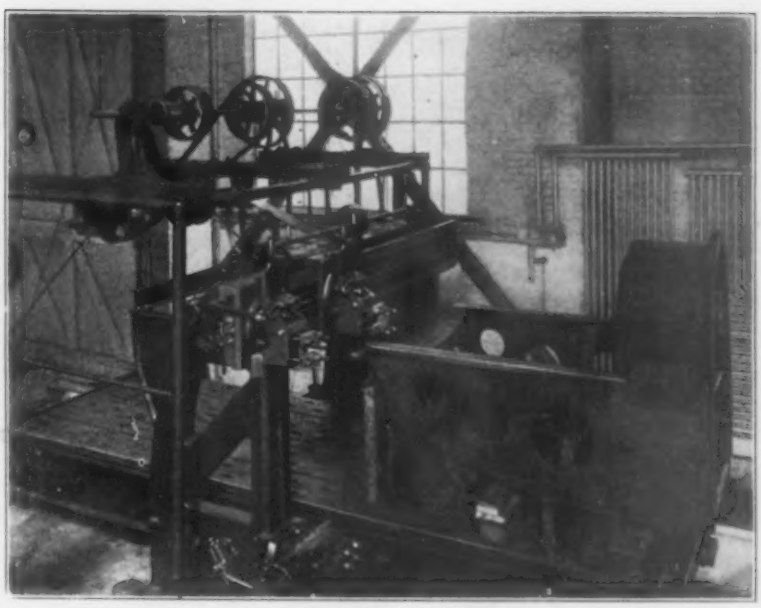
So far as possible, the practice of the company is to segregate the handling of various types of machines; that is, one group of men ordinarily handles milling and gear-cutting machines, another gives its attention to boring mills and boring machines, another handles planers, etc., the idea being to have certain men thoroughly familiar with certain types of tools and their construction. In the dismantling of a machine the small parts are placed in metal pans, each of which is appropriately labeled, badly worn parts being laid aside for repairs or entire replacement in the machine department. All the other parts go to buffing machines, where they are repolished, a process which fre-



Horizontal Boring Mill Completely Dismantled in shop of Hill, Clarke & Co. In the foreground is a large gear, the teeth of which are badly damaged.

quently discloses defects which indicate that the attention of the machine department is further needed.

The main casting is cleaned, and the old paint scraped, preparatory to a coat of filler. It is then sanded down, and given a coat of shellac before paint is applied. No preference is given to any machine in this respect, all receiving a new coat of paint, inside and out.



Planing the Front of the Housing of a 51-In. Boring Mill. The bearing surfaces had been found to be out of alignment, also not to be parallel. The trouble may have been caused by warping of unseasoned casting

RUNNING TESTS BEFORE SHIPMENT

Bearing surfaces are tested for accuracy with Brown & Sharpe straight edges up to 10 ft. in length, also with surface plates. In the testing, if surfaces are found to be wrong, they are planed before being scraped to a fit. The running test is accomplished by belting to the central line shaft already referred to, or with a portable motor-driven testing outfit. Three of the latter are available, one being designed for heavy machines. Countershafts are tested for balance and the pulleys for grip.

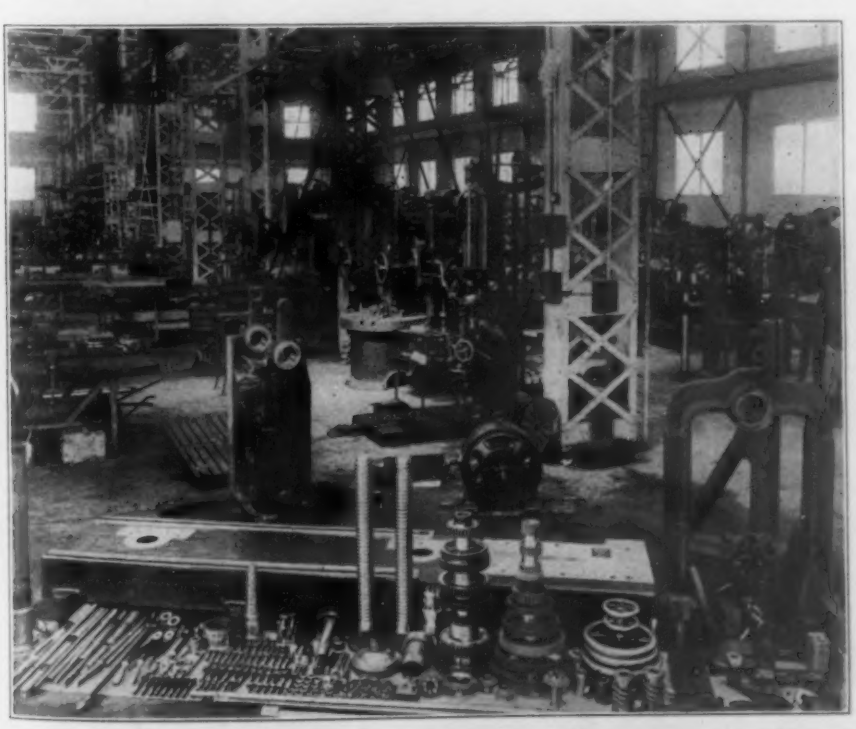
In stock are carried machinery steel, steel and bronze tubing, steel and iron gear blanks, and small parts and attachments for standard tools, all contained in racks or bins, sorted and labeled, making them readily accessible. The tool room contains a supply of cutters, hobs, drills, reamers, screws, keys, gages, straight edges and the numerous other appurtenances of a tool room. A checking system is used whereby a glance discloses the identity of the individual who is using a tool or device.

It follows that in a plant of this description many nice problems arise as to the best method of repairing worn or defective parts. Not always is the original design of a part adhered to, as there sometimes arise cases where the original design may be improved by being rendered stronger or more rigid, or more productive. A hexagonal turret has been placed on a machine on which a round one was originally used, the result being that six tools can be used on the rebuilt machine, instead of four as originally intended. Spindles have been improved by turning up the worn bearings in a lathe, then shrinking on a piece of Shelby tubing, the latter material being better metal than the spindle itself. In a case of this kind the strengthened spindle often runs in a new bushing of bronze. In one instance the badly worn and damaged teeth of a rack which had been cast as a part of the base of a machine were milled from the piece, and an entirely new rack of steel substituted.

In the illustration of a planing job on the housings of a 51-in. boring mill is shown an unusual operation. On examination it was found that the bearing surfaces were not in alignment, nor were they parallel, possibly a result of the internal readjustment of an unseasoned casting. The last-named defect is something which can be permanently corrected in a remanufactured machine.

It has been noted by the workmen of the company that nearly every machine which enters its shop is more or less defective by reason of a cast part which is out of true or alignment resultant from warping. The fault is invariably readily discernible, if the piece is large, when a straight edge is applied. Even milling machine tables have been found to show the effect of internal strains in a casting which had not been sufficiently seasoned before use.

The largest machine rebuilt by Hill, Clarke & Co. of Chicago was a 72 x 72-in. planer weighing 72,000 lb. Planing machines are considered among the most difficult to rebuild. They must be made to execute accurate work, and to run as quietly and smoothly as possible. In rebuilding planers instances have been found where the plate had buckled until the casting was convex to a degree which al-



Rebuilt Horizontal Boring Mill Ready for Assembly. Bearing surfaces have been renewed, and all parts cleaned and repolished. The bright gears are new

lowed the bearings to rest for only a few inches at either end of the V's.

The company employs from 50 to 75 machinists and helpers, who are encouraged to give suggestions as to the best way of accomplishing the work in hand, their thought and effort being stimulated by a bonus system. They are provided with enameled equipment for washing up, with steel lockers and other conveniences. The foremen have access to a file which contains a large number of catalogs and circulars descriptive of the machines on which they are working, enabling them to post themselves on the views of the manufacturers.

The selling side of the organization makes constant use of photographs. Lists enumerating and briefly describing the stock on hand are sent to prospective purchasers, and therewith notice that a "picture book" will be sent on request. The latter are pages on which appear halftones of the machines, with numbers corresponding to those in the lists. The company makes its own photographs, and through this medium has sold a large number of tools, especially for export. With the invoice of each export shipment is sent two photographs of each machine purchased, so that the purchaser can readily visualize what he is buying. From its offices and warerooms in the machinery district of Chicago visitors are motored to the plant.

Industrial Medical Service of the Future*

Radical Changes in Relationships of Physicians to Come—Industrial Dispensaries as the Alternative for Compulsory Sickness Insurance

IN the strikingly evolutionary programs of the twentieth century no group of individuals are about to have their oldtime relationships more radically changed than the physicians. Many factors, social and economic, will be responsible. Some of these most evolutionary changes will promptly and voluntarily come from within the profession, others will be forced upon the profession. It is evident that we have for all time passed beyond the stage of the absolutely individual and personal relationship of family physician and patient, to one where the community steps in to safeguard itself against any abuse of this circumscribed relationship and demands collective action in matters of health for the benefit of all. The concentration of population in cities has developed problems beyond the control of the private physician.

In the train of density of population have come the tenement sweatshop, bad housing and living conditions, tuberculosis, alcoholism, venereal disease, poverty, delinquency and crime. The development of industry with its occupational hazards, has created another series of health impairments which the family physician may have the knowledge to alleviate but whose prevention is entirely beyond his control. The establishment of the public health department was a partial answer to these new social requirements.

Unemployment, seasonal employment, the physically unfit, the unemployable, the industrial hobo, the labor turnover, all loom up as medical and social problems of such huge size as to spell defeat of their solution.

Broad Prevention Obtainable Through Industry

Society is realizing that the problems of industry are largely its problems—that the major portion of the community is engaged in industry—that when badly administered, it is therefore a menace to the peace, health and happiness of the whole community. When properly administered it is of inestimable value, socially and economically. Whatever industry does, because of its size, is impressive.

We are indebted to the proponents of social insurance for setting forth the direct relationship between poverty and disease, for emphasizing the economic advantage to society of grappling vigorously with the problem of disease, for pointing out the shortcomings and the inadequacy of present medical service. The argument has crystallized recognition of the immense contribution that scientific preventive medicine should make to the nation's better health. But in the unfortunate haste to legislate and their intolerance of further discussion, they have not taken time to write into their instrument the fundamentals that attack disease and thereby prevent poverty.

It is not our purpose to decry compulsory-sickness insurance but to present a partial program for the socialization of medicine which will be worth while for itself, but which incidentally must finally become the foundation of any rational health-insurance plan against which will be found but few opponents.

Inasmuch as the proposed health insurance bill revolutionizes the relationships of the physician, we are by that act immediately threatened with a new future for the practice of medicine. Is it not timely, therefore, that the medical profession should decide what that future shall be?

The subject of adequate medical service is of vital interest to the wage earner, the political economist, the physician, the employer and the public. Ours is an effort through group practice or a symposium to diagnose our social miseries and then to write a prescription. It is fair to assume that if a program can be devised that will meet the needs of the individual it can probably be extended advantageously to meet the needs of the community.

Now what are the individual social needs?

1. Health, so that he may work effectively and so earn a good wage.
2. An industry free from health and accident hazards.
3. A healthful home accessible to his work.
4. Intelligent medical care in time of illness.
5. Protection to his home and industry.
6. Good schools which safeguard the health of his children.
7. A health department which will protect his family against contagious diseases and safeguard his food supplies.
8. Healthful recreation for himself and family.

It will be seen at a glance that his success and happiness is all predicated on his health and that of his family; that this health is possible only through collective action; that the family physician only appears when some health agency has failed to prevent disease. For the reason that most physicians are still individualistic and have failed to recognize that health is no longer a personal matter, a discussion of the necessary changes in the practice of medicine is timely.

If war has proved anything it is that military success is dependent upon industrial efficiency of the country. The health of the industrial units has loomed up as of paramount importance. We are equally concerned with the health of individuals in these units in peace times since they form the major portion of the community.

Industrial Hygiene a Big Field for Medical Practice

Perhaps the greatest change that has come in medical practice has been the development of the field of industrial hygiene. It is now taking the whole time of

*From an address by Dr. Otto P. Geier, medical director Cincinnati Milling Machine Company, Cincinnati, presiding at the preventive-medicine section of the American Medical Association, Biltmore Hotel, New York, June 6.

thousands of physicians in the "medical supervision and care of employees" and it would seem that the beginning has just been made. No doubt this latter situation has been stimulated by workmen's compensation acts, but it is equally due to the awakening social consciousness on the part of the manufacturer. He has learned that the health of the worker is a definite asset in his business. Medical care in industry is not a charity. It pays good dividends.

In strong contrast to compulsory-sickness insurance the industrial-dispensary plan assures constant watchfulness over the health of the industrial worker, and brings to light economic pressure for the elimination of industrial hazards. At the same time the wage of the worker is raised because such care increases his capacity for work and therefore further reduces the necessity for charity in one form or another. You secure a new arm of the health department and make possible preventive medicine such as we have never yet dreamed of.

It does not take much imagination, therefore, to foresee the time when practically all of the industrial workers will be under daily supervision through industrial dispensaries. For the first time, then, we can begin to collect accurate data on morbidity. The very limited registration area reflects the backward state of scientific preventive medicine. Absence from work is an economic question, and industry is going to know the reasons why a man is off from work and from what illness he is suffering. As to the claimed loss of 9 days per year per man, of $500,000,000, on account of illness, private initiative, through the industrial dispensary, has shown that this loss can be reduced by one-half without charge on any one but the employer and this money is gladly spent because it is economically sound to do so.

Now the questions arise, what relationship will this new industrial medicine bear to public health work? Should it not have some kind of supervision from the health department so that its work may be best coordinated? And, lastly, would not industry co-operate in making industrial hygiene compulsory?

This type of socialized medicine will be intensively preventive, entirely democratic. It will discover disease in its incipiency. It will prevent loss from illness instead of merely paying through compulsory-sickness insurance a certain fraction of that loss. It will attack directly such problems as bad housing, venereal diseases, alcoholism, tuberculosis, and thereby make a fundamental contribution to social welfare. In comparison the proposed sickness insurance legislation is merely palliative and tends actually to cover over and hide the various "social ulcers."

To socialize medicine to the extent suggested, we would improve that time-honored and most desirable relationship between the family physician and patient. This immediate and definite response to social need would avoid the lowering of standards that are likely to come with the introduction of the panelized physician.

In conclusion, private-health practice and public-health practice must be improved. The knowledge of the prevention of disease, its diagnosis and cure must be advanced. Higher personal and ethical standards must prevail. This better day will be hastened by a more general adoption of the group-practice plan. More men must fit themselves for the distinct specialty of industrial medicine. The supervision of school children and pre-school children should be extended through the establishment of school dispensaries.

C. E. Hoyt, manager of the department of exhibits, American Foundrymen's Association, has already registered reservations of space for the Boston exhibition in the week of Sept. 24, exceeding the total used at the 1915 exhibit at Atlantic City. The number of exhibitors who have applied is more than 100.

The Sizer Forge Company, Buffalo, has opened a district office at 111 Broadway, New York City, with James A. Gibney, Jr., in charge.

Flexible Shaft Company's New Plant

The Chicago Flexible Shaft Company, LaSalle and Ontario Streets, Chicago, will move next month from its present location to a new plant at Fifty-sixth Avenue and Twelfth Street, Chicago. The building is ready for occupancy, and the company's furnace department has already been transferred. The old equipment will be augmented by new machinery for which contracts were made several months ago.

The new plant is 300 x 490 ft., one story, of sawtooth construction, with brick walls and concrete floors, and enables a 50 per cent increase of capacity. It has a railroad siding served by the Chicago Belt Line. It will be equipped with a private power plant, although it is planned to use public service current. Most of the company's machines are motor driven.

The factory has approved provisions for light, ventilation and the comfort of employees. About 300 are employed at present. An unusual feature consists of garages within the walls of the plant proper. One of these is for motor trucks, and has an entrance to the floor of the shipping department, so that bad weather inflicts no inconvenience in loading. Another garage is for the automobiles used by the executives and officers of the company, and still another for the cars owned by subordinate employees, there being enough of these to justify an inclosed parking space.

The company manufactures the Stewart oil and gas blast furnaces, rotary pressure blowers, pyrometers, and a wide line of specialties, including gas engines, small tools, horse clipping and sheep shearing machines, electric irons, automobile and carriage heaters, etc.

The new plant will house all of the company's departments and obviate the necessity of using scattered rented space.

Record Copper Output in 1916

Smelter production of primary copper in the United States in 1916 was 1,928,000,000 lb., compared with 1,388,000,000 lb. in 1915, an increase of 39 per cent, according to the U. S. Geological Survey. The total production of refined copper was 2,259,387,315 lb., an increase of about 625,000,000 lb. over that of 1915, when it was 1,634,204,448 lb. Of the 1917 output of refined copper, 1,579,620,513 lb. was electrolytic; 269,794,531 lb. Lake copper; 12,469,050 lb. casting copper, and 26,868,105 lb. was pig copper. The foreign electrolytic is put at 370,635,116 lb. The output of secondary copper was 104,423,807 lb.

The apparent consumption of refined copper in the United States in 1916 is put at 1,429,755,266 lb., against 1,043,461,982 lb. in 1915. If to the 1,429,755,266 lb. of new refined copper is added the 594,423,807 lb. of secondary copper and copper in alloys produced during the year, it is found that a total of about 2,024,000,000 lb. of new and old copper was available for domestic consumption.

The New York offices of the General Electric Company will be moved June 16 from No. 30 Church Street to the Equitable Building, No. 120 Broadway, where it will occupy the entire twentieth floor. For nine years its offices have been at No. 30 Church Street, where the company located its New York offices when it outgrew the Edison Building, at No. 44 Broad Street. This building was originally built for the Edison General Electric Company which, in 1892, was combined with the Thomson-Houston Electric Company to form the General Electric Company. In the quarter century since the General Electric Company was formed, its business has increased from about $10,000,000 in gross sales the first year of its organization, to gross orders of $167,169,000 during the twenty-fifth year.

The Norfolk & Western Railway Company is departing from its usual practice by arranging to build a number of wooden coal cars to help out the general commercial situation.

Exports on Tonnage Basis Decline

Values in April Exceed Average of Six Months—Shipments of Machine Tools Not So Active—Imports Are Increasing

WASHINGTON, June 12, 1917.—While exports of iron and steel by values exceeded in April the average shipments of the past six months, there was a substantial decline compared with the figures for both March and January of this year and shipments of tonnage commodities fell to a point below that touched in any month since last July with the single exception of February, when a combination of circumstances resulted in minimum exports. In view of the fact that the general foreign commerce of the country was well sustained during April and that the food exports of the month have been beaten only by a small margin in January of this year, the submarine campaign can hardly be credited with the downward trend of iron and steel shipments which may speedily record a substantial recovery.

Exports of iron and steel by values during April gained 75 per cent over those of the corresponding month of 1916, but lost 8 per cent compared with the record total of March of this year. Shipments of tonnage commodities rose 38 per cent compared with those of April, 1916, but fell 19 per cent short of the high record of last September. Exports of machinery, though gaining 27 per cent over April, 1916, declined 11 per cent as compared with the high-water mark reached last August. Shipments of machine tools, doubtless reflecting the decreasing foreign demand for equipment for munitions plants, declined 5 per cent from the total of April, 1916, and no less than 37 per cent as compared with the high record of May, 1916. The machine tools exports for April have been exceeded in all but two of the past 12 months.

For the 10 months ended April, the total exports of iron and steel surpassed by 90 per cent those of 1916, which exceeded all previous records by more than 100 per cent. Shipments of tonnage commodities gained 50 per cent, machinery 50 per cent and machine tools 60 per cent over 1916.

The value of all shipments of iron and steel products in April, 1917, was $102,560,345, as compared with $58,722,411 for the same month of 1916, and $111,164,876 for March of this year, when high-water mark was reached. For the ten months ended April, 1917, the total was $903,106,411 as compared with $472,133,773 for the same period of 1916, which was an advance of considerably more than 100 per cent over any previous corresponding ten months. Exports of machinery in April were valued at $21,939,582 as compared with $17,526,899 for the same month of 1916. The April exports of machinery have been exceeded but three times during the past twelve months. Shipments of metal-working machinery aggregated $6,250,728 as against $6,552,397 for the same month of 1916. Maximum exports of metal-working machinery were recorded in May, 1916, when they aggregated $9,935,806. Exports of machinery of all kinds for the ten months ended April, 1917, were valued at $211,442,800 as compared with $140,150,965 for the corresponding period of 1916, which was an advance of nearly 50 per cent over any preceding ten months. Details of the exports of machinery for April, 1916 and 1917 and for the two ten-month periods are given in the accompanying table.

Exports of Iron and Steel

	April 1		Ten Months	
	1916 Gross Tons	1917 Gross Tons	1916 Gross Tons	1917 Gross Tons
Pig iron	18,518	44,783	209,336	696,412
Scrap	15,875	12,966	113,953	216,327
Bar iron	5,201	3,467	57,099	50,844
Wire rods	14,555	11,834	137,799	114,464
Steel bars	58,215	73,228	486,452	635,199
Billets, ingots and blooms, n.e.s.	88,764	162,209	703,021	1,577,205
Bolts and nuts	2,265	2,119	26,194	24,544
Hoops and bands	2,671	3,471	33,969	35,808
Horseshoes	695	459	10,706	3,703
Cut nails	174	323	3,434	3,882
Railroad spikes	3,057	809	22,347	15,496
Wire nails	10,884	6,999	99,370	104,724
All other nails, including tacks	634	1,804	7,822	15,216
Cast pipes and fittings	4,928	2,945	42,129	62,106
Wrought pipes and fittings	7,495	9,049	101,066	140,837
Radiators and cast-iron house heating boilers	123	458	1,972	3,225
Steel rails	22,346	38,410	443,197	513,224
Galvanized iron sheets and plates	5,484	5,724	61,960	74,155
All other iron sheets and plates	3,262	6,167	33,344	39,607
Steel plates	21,066	47,612	229,939	396,350
Steel sheets	9,128	9,757	78,812	91,259
Structural iron and steel	19,999	26,431	221,894	285,061
Tin and terne plates	21,384	19,936	175,137	184,206
Barb wire	27,689	13,763	287,548	277,291
All other wire	20,408	16,453	198,520	200,575
Total	384,920	521,176	3,787,030	5,665,921

Exports of Machinery

	April		Ten Months	
	1916	1917	1916	1917
Adding machines	$160,540	$236,224	$818,211	$1,430,553
Air-compressing machinery	35,813	127,124	437,883	945,018
Brewers' machinery	95	39,687	20,946	53,926
Cash registers	201,350	113,386	1,158,813	1,214,169
Parts of	10,183	12,201	102,601	108,377
Cotton gins	1,749	6,375	59,786	95,911
Cream separators	49,023	86,231	407,222	370,348
Elevators and elevator machinery	150,232	232,701	1,245,999	1,770,865
Electric locomotives	26,964	9,050	422,340	483,052
Gas engines, stationary	45,767	104,158	290,287	565,644
Gasoline engines	1,575,634	2,393,950	8,264,973	13,886,415
Steam engines	1,123,731	2,460,191	12,765,079	15,811,202
All other engines	449,321	635,379	2,198,116	4,141,770
Parts of	656,713	1,402,828	5,529,653	14,164,911
Laundry machinery, power	15,233	46,102	230,920	268,540
All other	18,061	19,092	224,362	264,777
Lawn mowers	15,775	25,099	153,239	141,668
Metal-working machinery (including metal-working tools)	6,552,397	6,250,728	42,913,241	69,833,155
Meters, gas and water	27,050	56,819	219,818	330,337
Milling machinery (flour and grist)	99,844	77,456	2,048,292	982,490
Mining machinery, oil well	64,901	81,629	908,229	1,552,150
All other	480,035	865,990	5,247,367	8,221,153
Paper-mill machinery	60,813	182,074	764,001	1,524,119
Printing presses	150,804	139,848	1,241,019	1,540,799
Pumps and pumping machinery	413,667	467,593	3,612,643	5,028,068
Refrigerating and ice-making machinery	47,034	70,696	557,531	718,052
Sewing machines	376,077	589,952	4,461,271	5,047,353
Shoe machinery	101,612	116,355	1,115,860	1,114,731
Sugar-mill machinery	180,490	627,011	5,451,814	9,950,165
Textile machinery	378,786	237,831	2,101,392	2,904,537
Typesetting machines	76,292	57,781	587,639	916,935
Typewriting machines	726,170	944,931	7,021,721	9,281,693
Windmills	170,939	115,516	895,109	712,782
Wood-working machinery, saw-mill	32,387	35,637	295,213	391,878
All other	63,481	63,706	946,473	801,399
All other machinery, and parts of	2,987,936	3,008,215	25,431,902	34,873,258
Total	$17,526,899	$21,939,582	$140,150,965	$211,442,800

Exports of iron and steel for which quantities are given aggregated 521,176 gross tons in April, 1917, as compared with 384,920 tons in the same month of 1916. September, 1916, still holds the record for exports of these commodities with a total of 643,763 gross tons. The shipments in March of this year aggregated 606,560 gross tons. For the ten months ended April, 1917, the shipments were 5,665,921 gross tons as compared with 3,787,030 tons for the same period of 1916. An accompanying table shows the exports for April and for the ten months ended April, 1917, as compared with 1916.

The upward tendency of imports noted in March was sustained in April, showing a gain of not less than 140 per cent as compared with the same month of 1916. As heretofore, the increase was almost wholly due to larger receipts of scrap. Imports of ferromanganese made a record total of 6846 gross tons for the period since this item has been differentiated from "all other pig iron." The total receipts of tonnage iron and steel in April aggregated 48,213 gross tons as compared with 20,028 tons for the same month of 1916. The imports for the ten months ended April, 1917, were 414,914 as compared with 250,571 in 1916. The accompanying table shows the imports of tonnage commodities for April, 1916, and for the ten months ended April, as compared with 1916.

Imports of Iron and Steel

	April		Ten Months	
	1916 Gross Tons	1917 Gross Tons	1916 Gross Tons	1917 Gross Tons
Ferromanganese	...	6,846	...	67,905
Ferrosilicon	754	1,108	4,516	96,321
All other pig iron	7,926	817	89,708	28,271
Scrap	6,116	34,681	85,737	181,844
Bar iron	756	60	6,127	4,208
Structural iron and steel	139	63	1,238	793
Hoop or band iron	...	...	470	...
Steel billets without alloys	1,957	3,529	8,447	9,676
All other steel billets	1,259	401	8,459	9,756
Steel rails	483	577	40,037	11,786
Sheets and plates	157	97	1,467	1,683
Tin and terne plates	179	34	673	608
Wire rods	302	...	3,692	2,063
Total	20,028	48,213	250,571	414,914

Moving a Blast Furnace

Moving a blast furnace is something new in the iron and steel industry, but this has been undertaken by the Algoma Steel Company, which has purchased the No. 2 furnace of the former Canada Iron Corporation, Midland, Ontario, and is now moving the entire furnace, including stoves, boilers and buildings, in fact everything but the foundations from Midland to Sault Ste. Marie, a distance of about 400 miles.

The steel company purchased this unused furnace because it expected that it could dismantle the plant and reerect it in much quicker time than a new furnace could be built under present conditions. This is a 275-ton stack, but it will be enlarged to a 375 to 400-ton stack. It has four stoves, three of these being practically new, having been built three years ago.

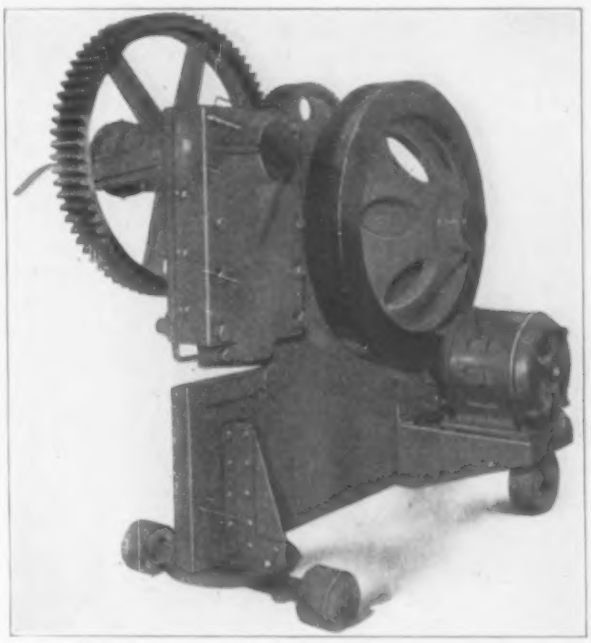
The contract for moving the furnace and supplying additional material required for its reerection and enlargement has been placed with Arthur G. McKee & Co., consulting and contracting engineers, Cleveland. It is planned to have the furnace ready to blow in at its new site in eight months from the time the work of dismantling it was started.

A paper on workingmen's baths, illustrated with drawings showing different types of industrial bathing rooms, was presented before the American Association for Promoting Hygiene and Public Baths at Pittsburgh on May 8 by August P. Windolph, treasurer of the association and a member of the firm of Werner & Windolph, architects, 25 West Thirty-third Street, New York.

The United States Mineral Wool Co., Netcong, N. J., has closed its plant indefinitely owing to the falling off of new construction as a result of the war.

Portable Heavy Power Shearing Machine

A line of power cut-off shearing machines mounted on a set of wheels has been brought out by the Buffalo Forge Company, Buffalo. Four sizes are built, the largest, which is the one illustrated, cutting flat bars



Flat Stock Up to 1¼ x 5 In. and Proportionate Sizes of Round and Square Bars and Angles Can Be Handled by This Portable Motor-Driven Shearing Machine

up to a maximum cross-section of 1⅛x5 in. Round stock 1¾ in. in diameter, 1½-in. square bars and 5x5x9/16-in. angles can also be handled.

The frame is built up of 3½-in. steel armor plate. A 15-hp. motor supplies the power for operating the machine, a jaw clutch being employed for starting and stopping. Double back gears of cast iron with cut teeth are provided and the driving pinion on the motor is of steel. The plungers are large and have cast-ron guides. The bearings are bushed with bronze and have ring oiling devices. If desired, tight and loose pulleys for a belt drive can be provided in place of an electric motor.

Austrian Steel Syndicate Dissolved

According to a report from Zurich, Switzerland, published in the London *Iron and Coal Trade Review*, the Austrian Steel Syndicate has been dissolved, after an existence of over 30 years, in order to avoid a conflict with the new laws against "profiteering," and as a result the shares of all Austrian iron and steel companies have fallen considerably in value. The collapse of the trust constitutes a serious blow to German industrial influence in Austria, as it was backed by German capital and was actively supported by the German iron and steel interests.

Chile's copper mine output in 1916 was nearly 20,000 tons greater than in 1915. The shipments, figured as fine copper, in the bars, concentrates and ores, were 71,430 tons against 52,081 tons in 1915. These are the highest figures ever attained in the copper industry of Chile. The increase is due to the greater output at Chuquicamata and Teniente, the plant of the former mines having been increased so that the 1917 output will probably exceed the increase in 1916.

The Driver-Harris Wire Company, Harrison, N. J., has filed notice that its name has been changed to Driver-Harris Company. While wire makes up an important part of the company's production, it manufactures largely alloys and pure metals in the form of strip, rods, sheets and castings, also flexible heater cords and wire rope.

FERROMANGANESE SUPPLIES

Domestic Production at Record Rate—Imports and the Quantity Available

Ferromanganese production, and that of spiegeleisen as well, has made rapid strides in the United States in the past eight months. The output of the former is now practically 20,000 tons per month, and that of the latter nearly 19,500 tons per month. In view of war conditions and the rapid increase in our steel production, these facts are of vital importance.

The domestic ferromanganese output since last October, the first month in which over 20,000 tons was ever made, is given in the following table as compiled from the blast-furnace returns of THE IRON AGE, spiegeleisen being also included for comparison:

	Ferromanganese	Spiegeleisen	Total, Gross Tons
October, 1916	21,374	13,192	34,566
November	20,681	24,294	44,975
December	19,632	24,035	43,667
January, 1917	21,130	17,662	38,792
February	19,942	12,195	32,137
March	18,529	18,034	36,563
April	17,989	22,940	40,929
May	20,722	23,079	43,801
Totals	159,999	155,431	315,430
Average per month for 8 months	19,999	19,429	39,428
Average per month in 1916	18,461	16,166	34,627

If this rate of production is maintained throughout 1917, the output for this year will exceed all records, and will consist of 240,000 tons of ferromanganese and 233,000 tons of spiegeleisen, as compared with 221,532 tons and 194,002 tons respectively in 1916.

Of almost equal importance are the imports of British ferromanganese. While these are not as large this year as they were in 1916 and previous years, they have not been seriously curtailed. The following table gives the data:

	Gross Tons
January	6,211
February	6,379
March	5,324
April	6,846
	24,760
Average per month	6,190
Average per month in 1916	7,577

If the present import rate is maintained in 1917, the total imports will aggregate 74,400 tons, compared with 90,928 tons in 1916. According to these compilations, the total available supply of ferromanganese in 1917 will approximate 315,000 tons.

Amount of Ferromanganese Necessary

Assuming that our steel output in 1917 will reach 45,000,000 tons, and that 74 per cent of this is open-hearth steel, as in 1916, with two-fifths of the Bessemer steel output absorbing only spiegeleisen as high carbon steel, we have the following as the estimated amount of ferromanganese necessary this year, at 17 lb. per ton of steel produced:

	Gross Tons	
45,000,000 × 0.74	= 33,300,000	open-hearth stl.
45,000,000 — 33,300,000	= 11,700,000	Bessemer steel
11,700,000 × 2/5	= 4,680,000	high carbon Bessemer steel
11,700,000 — 4,680,000	= 7,020,000	low carbon Bessemer steel
33,300,000 + 7,020,000	= 40,320,000	steel requiring ferromanganese
40,320,000 × 17 = 685,440,000 lb.	= 306,000	ferromanganese necessary in 1917

To meet this estimated consumption of 306,000 tons of ferromanganese in 1917, we have 240,000 tons as the calculated output of our own furnaces, and an apparently assured import supply of about 70,000 tons, or a total of 310,000 tons. A shortage does not seem imminent if present conditions prevail.

American and British Ore Supply

The ore supply is an important factor in the analysis of this subject. Imports into the United States in 1917 are very large thus far, exceeding the phenomenal record made in 1916. In January they were 49,530 gross tons, in February 39,796 tons, and in March 56,394 tons, making 145,720 tons to April 1. This is at the rate of 48,573 tons per month, exceeding that of 1916, which was 48,026 tons per month. At this rate the 1917 imports will be nearly 583,000 tons, against 576,321 tons in 1916. Of the latter nearly 82 per cent came from Brazil.

The ore situation in Great Britain is not so favorable. The imports to May 1, 1917, have been at the rate of 30,649 tons per month, comparing with 33,149 tons per month to May 1, 1916, and with 31,060 tons per month in 1916 and 36,625 tons per month in 1915. Before the war the rate was over 50,000 tons per month, as in 1913. A maintenance of at least 30,000 tons per month is necessary in order for Great Britain to keep up her shipments to us.

Tying Contracts Disapproved

WASHINGTON, June 12, 1917.—Agreements technically known as "tying contracts" have been put under the ban by the Federal Trade Commission, which has issued an order against the A. B. Dick Company of Illinois to cease making sales of mimeographs conditioned upon the purchase by the buyers of the paper and materials supplied by the Dick Company. The commission holds that the methods pursued by the Dick Company are in violation of section 3 of the Clayton Act, which prohibits tying contracts where the effect may be to substantially lessen competition or tend to create a monopoly.

This is the first adjudication by any tribunal of an alleged violation of section 3 of the Clayton Act, which was passed October 15, 1914. The commission finds that the tying contract as employed by the Dick Company prevents all other manufacturers from selling their supplies for use on the Dick machines, and that these conditions have imposed burdens on the users of the Dick machines by compelling them to pay an increased price for the Dick supplies over what they would be required to pay for the supplies of competitors.

Decrease in Steel Corporation's Orders

The monthly statement of the United States Steel Corporation shows unfilled orders on its books as of May 31, 1917, of 11,886,591 tons, which is a decrease of 296,492 tons from the amount reported April 30, 1917, which was 12,183,083 tons, a record showing. The report for May is next to the largest, however, ever made, the unfilled orders for March, 1917, ranking third. The following table gives the unfilled tonnage at the end of each month from January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,613,680
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,653,825
April	12,183,083	9,829,551	4,162,244	4,277,068
May	11,886,591	9,937,798	4,264,598	3,998,160
June		9,640,458	4,678,196	4,032,857
July		9,593,592	4,928,540	4,158,589
August		9,660,357	4,908,445	4,213,331
September		9,522,584	5,317,618	2,787,667
October		10,015,260	6,165,452	3,461,097
November		11,058,542	7,189,489	3,324,592
December		11,547,286	7,806,220	3,836,643

Motor trucks are being used with success by some manufacturers to facilitate the arrival of freight shipments, according to R. E. Chamberlain, truck sales manager for a Detroit motor company. Traffic congestion has become so great in some large manufacturing centers that loaded freight cars often remain for days just outside the terminal, and cannot be brought to the freight warehouses for lack of track facilities. Consignees in a number of instances have sent motor trucks out to the point where the cars got stalled, and there unloading the freight.

A full holiday with a half day's pay was granted the employees of the Stowell Company, founder and manufacturer of farm and wagon hardware, South Milwaukee, Wis., for flag-raising exercises, which were held on registration day, June 5. Fred W. Rogers, president of the company, delivered an address, and Phillips Boyer, who has been continuously in the service of the company 28 years, raised the flag.

Hammering, Pressing or Rolling Steel*

Fields of the Press and the Hammer— Relative Inferiority of Rolled Products — Armor Plates Rolled in Europe

BY JOHN L. COX

TO obtain the highest physical results on test, steel must be well melted, well poured and properly worked so as to produce maximum flow in the direction of testing. If flow must be given in other directions it should be given as early as possible and the final flow be in the direction of testing. Often it happens that the stresses in an engineering member are not chiefly in one direction. Then it is advantageous to develop the properties in several directions without improving them excessively in one. Thus, a steel plate is usually rolled crosswise and cornerwise before being given its final length, while the belief is general that a forged axle, kneaded back and forth under a hammer or press, is superior to one rolled—with the work all in one direction.

Function of Hot Working

The function of hot working is twofold,—to bring the ingot to the dimensions desired in the completed article, and to break up the coarse structure of casting. The finer the final structure, the tougher and more ductile will be the steel, other things being equal. This final fine grained structure in turn is dependent on a proper heating, both as regards time and temperature, to break up the ingot structure, and upon a thorough working, during cooling, to complete this grain refinement,—a working continued to a temperature throughout which will not allow much grain growth when it is ended. I see little advantage in a great amount of hot working above what is required by these considerations, and much against it. Excessive reduction means larger ingots to start with; larger ingots mean more internal troubles, and more internal troubles mean poorer quality of product.

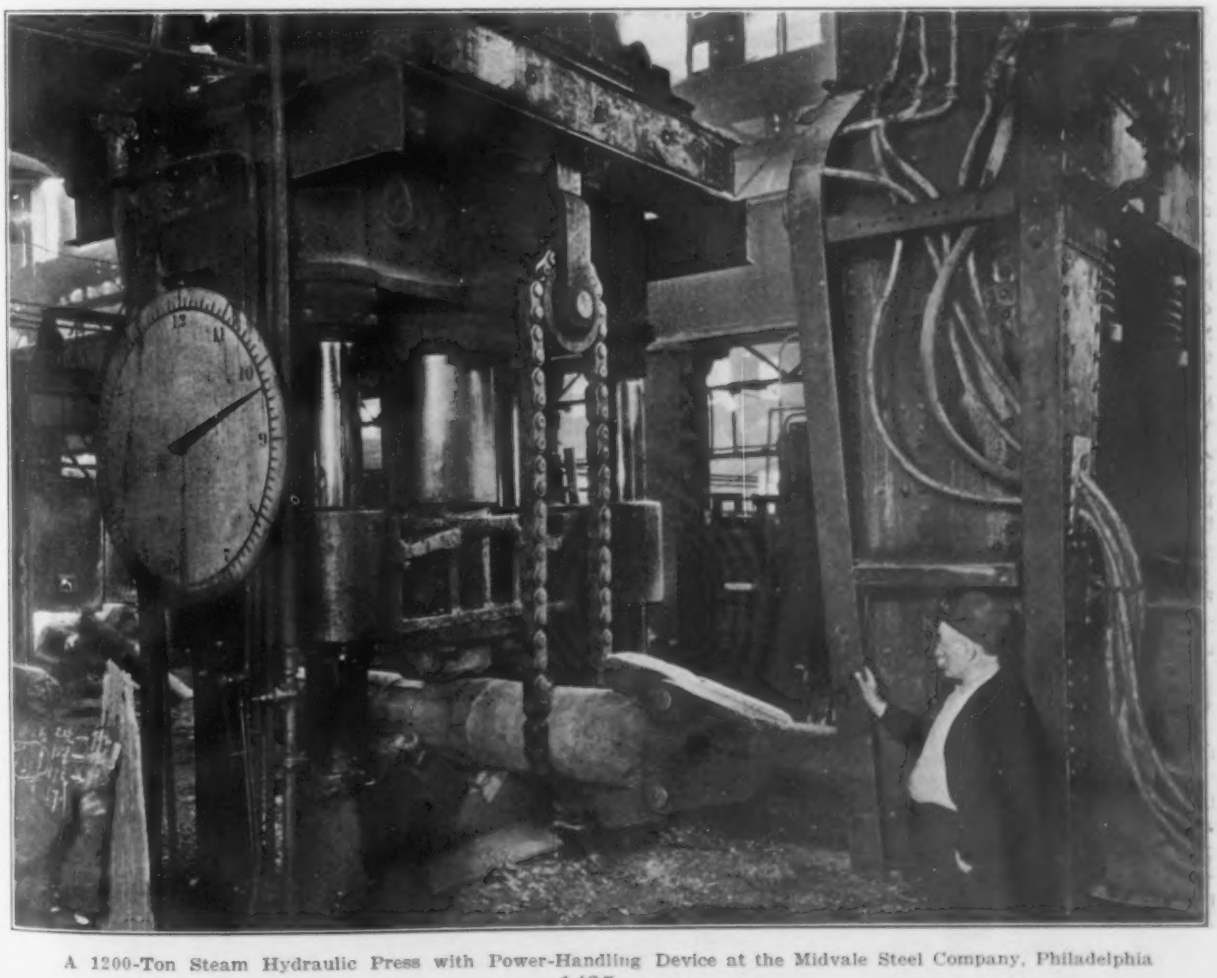
Let us now get clearly in mind the desiderata in our hot working machine. It is to reduce to the final dimensions, at least expense, in the least time, an ingot with a section sufficient to give a proper amount of work and a low finishing temperature, and is to pay due regard to the proper direction of the defects inevitably found in the metal.

Where there is available sufficient tonnage to keep it occupied on work suited to its limitations, a mill is far more economical than either a press or a hammer. It stands quite in a class by itself, so far does it lead its competitors in quantity of output and economy of operation,—while it has its own field of thin sections which neither of the others can enter.

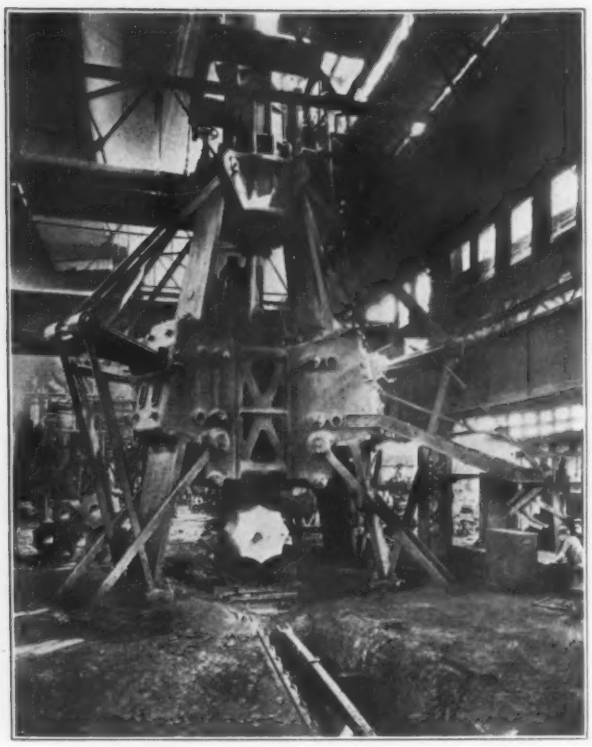
Yields of the Press and the Hammer

It is generally understood that a forging press costs about as much as an equivalent hammer with its foundations. A well designed press uses probably not one-third of the steam consumed by the hammer; its tools are lighter and more convenient, being free from shock, and there is much less breakage. In most cases the output from a hammer is less than from a press,

*From a paper delivered before the twelfth general meeting of the American Iron and Steel Institute in New York, May 25, 1917. The author is engineer Midvale Steel Company, Philadelphia.



A 1200-Ton Steam Hydraulic Press with Power-Handling Device at the Midvale Steel Company, Philadelphia



The 25-Ton Double-Acting Steam Hammer, Midvale Steel Company, Philadelphia, Pa. It has a 50-in. cylinder and a 9 ft. 6 in. stroke

but when used for cogging down ingots for subsequent rolling, the press cannot compete with the hammer, even though it be equipped with power handling devices.

Under a 10-ton double-acting hammer cogging 14-in. square ingots to 5½-in. square, corners broken, cut in lengths, an average output for 8 hr. was 30 ingots, on occasions 34; while the average output of a 1200-ton steam hydraulic press was 22 ingots, occasionally 27. This experience was confirmed in another works, where a 500-ton press bought for a similar purpose was turned on forgings, as it could not do the cogging economically. There yet remain two standards: Availability for specific purposes, and quality of output.

With the increase in the size of naval guns a heavier tool became necessary and in 1888 the Midvale Steel Company began the erection of a 25-ton double-acting hammer with 50-in. cylinder and 9-ft. 6-in. stroke, built by the Morgan Engineering Company from designs by the late Frederick W. Taylor. This tool was probably the most effective hammer ever built. The forging was controlled entirely by power. The ingot was brought from its heating furnace to the hammer with the free end of its porter-bar fastened to a trolley in an underground conduit. When the ingot was landed on the die, the trolley was disconnected and on the porter-bar was thrown a heavy ring connected by a wire rope to a horizontal underground hydraulic cylinder which did all the weighing-on of the usual crowd of men. The 60-ton traveling forge crane rotated the piece on the die and the overhang was sustained at first by a gantry, later by a 25-ton traveling crane.

With this powerful tool 13-in. gun forgings were made in quantities from ingots as large as 63-in. octagon, in spite of prediction to the contrary, and with excellent results.

Largest Hammer Ever Built

The largest hammer ever built was the 125-ton single-acting hammer of the Bethlehem Steel Company, intended for the forging of armor plate. Both it and the 25-ton double-acting hammer of Midvale, really a 75-ton as compared with a single-acting hammer, have been abandoned for forging presses.

With the exception of the tube, which is generally made solid, the larger forgings for heavy artillery are usually made hollow, as are marine shafts and other forgings when desired of especially high quality. As it is difficult to manipulate under a hammer, in upsetting and punching, blocks too heavy to be handled on levers, it is customary to bore the ingot with a hole of suitable size and cut from it a hollow block of proper weight for the job in hand. The hole in this block must be larger than the mandrel upon which the block is to be forged, involving great waste of metal if the mandrel be large. To avoid this waste, and in the case of gun forgings to assist in the proper direction of the contained imperfections, the billet is first bored with a smaller hole, then hung upon a mandrel supported at each end in a housing die keyed on the anvil block in place of the bottom die, and by blows upon the periphery as the billet is turned upon the mandrel its walls are thinned and the interior diameter increased until it is of the desired size. It may then be placed upon a drawing mandrel of the proper diameter for the final bore and drawn out in a V die to the desired exterior form and size, if required.

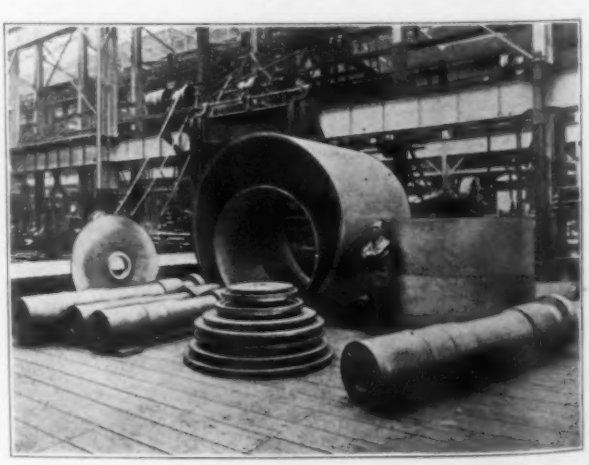
The width of a hammer anvil block is not great and if the forging be heavy it is in practice necessary to use an ingot of initial section sufficient to give the requisite weight in the short length that will go between the cheeks of the mandrel housing, for upsetting of heavy blocks under a hammer is impracticable, as previously stated. The employment of ingots of large cross section being objectionable for reasons already given, as also because of the added dangers in cooling and reheating and in the time consumed thereby, we have here one weakness of the hammer. It cannot make the great hollow forgings, easily producible under a press, such as the rotor drums for steam turbines and the field rings for Niagara turbines shown in the illustrations.

When under a hammer of ample power, forgings show test results practically identical with pressed forgings made under the same conditions, so long as neither be expanded. The danger in solid hammered work is always that for economy's sake too light a hammer will be used and the forging left with an imperfectly reduced grain size towards the center.

Invention of the Forging Press

In 1861, Manassah Gledhill, of Manchester, England, invented the forging press. Mr. Gledhill was at first an employe and later an associate of Sir Joseph Whitworth, by whose name the press became known. It was another case of "The page slew the boar, but the peer had the gloire." For many years this wonderful machine was used secretly in the Whitworth shops, and so far as I am aware it was not until 1887 that it was sold for outside use and was brought to this country by the Bethlehem Iron Company.

Since a press is wholly self-contained and its movement comparatively slow, giving time for the flow of the metal, there is no rebouund of the anvil block to throw out of position a forging being expanded, and successive impressions of the top die can be made very close together. This permits the use of narrow-face dies, reducing to a minimum the load to be borne by the expanding mandrel. As small a mandrel as 11 in. can be used with a 5-ft. span with no more liability of



Rotor Drums for Steam Turbines Forged by the Midvale Steel Company

breakage than a 14-in. mandrel with a 45-in. span under a hammer.

In cogging down an ingot under a hammer, before rounding up begins, several blows are usually struck in the same spot until fear of lapping stops them. Due to the inertia of the part of the ingot beyond the die, at the instant the blow falls there is a tendency to cock up the end of the piece and as there is no ready means of taking out this short kink, except by turning the piece upside down, the tendency is to let it occur and for the hammer die to cut in more deeply on one side of the ingot than the other, gradually throwing the axis of the forging out of the axis of the ingot. This does not occur under a press. There the tendency is for the live die to cut in a little deeper than the dead die and bend the piece down; but the piece is revolved after every impression, which tends to keep it straight, and as the movement of the press is comparatively slow, the cranes lower in unison with it. If the forging becomes bent, if not too stiff it can be straightened by one of them pulling up while the pressure is on, or by running up the forging carriages and straightening the piece between them.

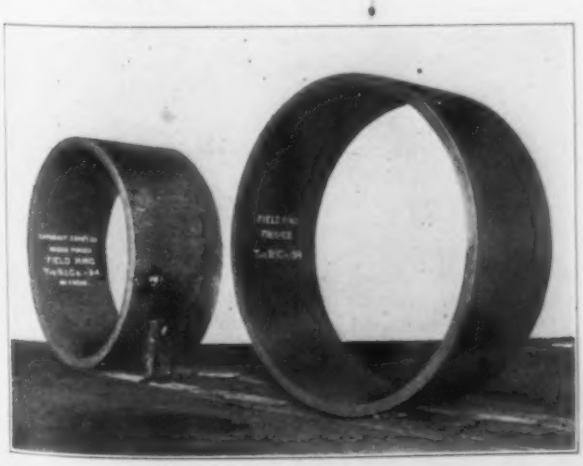
I have spoken of the speed of the press. In large tools of the Whitworth type this varies from about 12½ to 16½ ft. per minute. In finishing, 30 to 40 short strokes can be made per minute, the practical limit being in the speed of the turning mechanism. Some steam hydraulic presses run still faster and are capable of giving 60 to 80 strokes per minute in sizes where the work can be turned by hand.

Failings of the Press

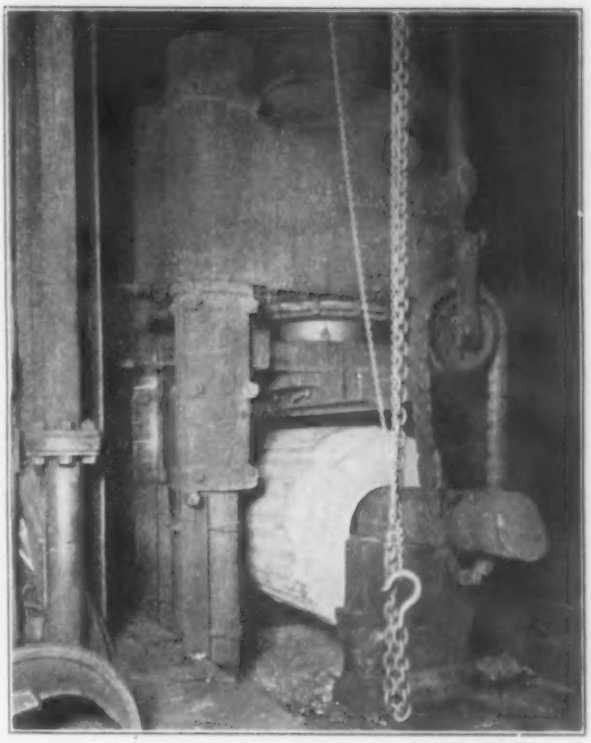
The advantages of absence of shock, in addition to the weight to be handled in forging such masses of steel as the 320,000-lb. ingot, shown in an illustration, can be readily appreciated by everyone, yet in spite of all its excellencies and its adaptability to a wider variety of work, even such as hot planing the defects from heavy armor plate, the press has two failings, both due to its lack of impact; first, it is harder to get rid of scale; second, it cannot strike in a mold as large a forging as a hammer its equivalent in other respects. In our experience we consider a 500-ton press the equivalent of a 2¼-ton hammer, a 1200-ton press the equivalent of a 10-ton hammer, a 2500-ton press the equivalent of a 25-ton hammer; yet a 4½-ton hammer can make drop forgings which are beyond the power of a 1200-ton press, and a 2¼-ton hammer can about equal it.

Rolling Steel Compared With Other Methods

To institute a comparison between the effects of rolling and the effects of hammering or pressing is much more difficult than to compare with each other the effects of the two latter methods. Each has wide fields of application with fairly well defined boundaries, yet there is a neutral zone in which both operate. Heavy plates are produced both by the press and mill, billets and medium sized rounds, squares and flats, by all three instrumentalities, and small regular sections of tool steel by the hammer and the mill.



Field Rings for Niagara Turbines Forged by the Bethlehem Steel Company, South Bethlehem, Pa.



Whitworth Forging Press, 3000-Ton, Now Being Used by the Midvale Steel Company at Philadelphia

The action of a rolling mill is quite different from that of either the hammer or press. In both of these latter the action of the pressure is normal to the face of the die and the pressure equal at all points on flat die faces. In the rolling mill compression is most rapid and therefore the pressure greatest at the line of intersection between the faces of the rolls and the surface of the unreduced portion of the object going through them. There is also a much narrower limit in reduction and none can be taken in excess of that which can be pulled between the rolls by the friction of their surfaces with the hot metal, frequently assisted by the ragging of the rolls.

The tendency of rolling is to have a more superficial action than either hammering or pressing. The operation of rolling is far more rapid than either pressing or hammering, with a consequent high finishing temperature. Again, a roll being generally in the condition of a beam supported at each end and loaded at some intermediate point, is much less able to stand high pressures than either a press or hammer and the fear of breaking rolls is always present in the roller's mind,—as well as the injury done to the shape of the passes by cool rolling.

Reasons for Inferiority of Rolled Products

The three points just considered constitute, I believe, the reasons for the common inferiority of rolled products. If a heavy mill were to roll its products from ingots at a low initial rolling temperature and finish them at the same temperature as material laid down from a press or hammer, I believe that the difference between rolled and forged products would largely disappear.

Hot-rolling tends to prevent the development of surface defects, but hot-rolled material will not give good results on physical test, hence it is common for rolling mills to refuse orders for billets to show definite physical properties and to insist upon a chemical test only, whereas forged bilets are frequently tested physically.

Due to the difference between the methods with which they are produced, there is often a distinct difference in the cross section of rolled and forged plates. Owing both to the rapid cooling of thin plates and to the excessive pressures required for their production under the press, it is found that there is a practical limit to the thinness of the forged plates at about 5 in.

A 320,000-Lb. Ingot—One of the Large Masses of Steel That Have to be Handled and Forged in Present Day Practice

A Hot-Planed Section of Modern Armor Plate, Midvale Steel Company, and the Machine That Does the Work

Armor Plates Rolled In Europe

In this country all except the thinnest armor plates are pressed, but in Europe, where the demands for armor are sufficiently great to warrant investment in a machine capable of the great output of a mill, armor plates are frequently rolled. Enormous mills for this work exist in a number of public and private establishments, both in England and on the Continent. At one English works, certainly until recently, the custom was to rough out the plates under a press, cut off the scrap and finish them by rolling.

One process that the mill cannot carry out is the reforging of an armor plate after carburization. This must be done at a low heat under a press with a minimum disturbance of the carburized face.

Discussion by E. O. Acker*

There can be no doubt that the men in the forging business as well as users of steel forgings are under great obligations to Mr. Cox for his valuable paper on this subject, embodying as it does, his years of experience in this work. It is to be regretted that he has not had time to write a complete treatise on the subject.

Proper Finishing Temperature of Forgings

While all the points in Mr. Cox's paper are of the greatest importance, one of the most important is the proper finishing temperature. Probably this has been neglected as much as any other point in the making of forgings in this country. Perhaps not over 10 per cent of the forgings made today are finished at the right temperature. Many years ago when Owen Liebert brought over to Bethlehem the practice of the Whitworth Company it was customary to finish much colder and to very much closer dimensions than is done today. Part of this is undoubtedly due to the fact that at that time steel shafting was selling for 8 to 10c per lb., but since then prices as low as 2c and 2.25c have been received.

The forgings made at that time usually had a glaze or polish as coming from the forge and were very true to dimensions; the physical results obtained from this material were such that the younger generation of people in the business do not credit them as being true, and this in spite of the fact that heat treatment at that time was not as well understood as it is at present.

We made a shaft for the U. S. cruiser California which averaged in six different test bars 70,000 lb. tensile strength per sq. in. with an average elongation of 40 per cent, and this shaft was simply annealed at a temperature of about 1150 to 1200 deg. Fahr. In other words, the proper forging at the right finishing temperature puts into steel a condition which cannot be equaled by shafts given the best heat treatment, but which are not properly forged. This is a subject which is not well understood and the microscope does not seem to aid in its solution.

Rifle Barrel Steel

Some of the members of the institute may be familiar with the rifle barrel steel which is used by the United States Government in the manufacture of small arms; the qualities of this steel are so high that it is necessary to finish it at the rolls at a temperature slightly below the absorption point of the steel and the qualities usually obtained in this material are about 130,000 lb. tensile strength per sq. in., 75,000 lb. elastic limit per sq. in. with 20 per cent elongation and about 50 per cent reduction of area. These bars after being rolled have the same glaze or polish as the shaft before mentioned.

The General Electric Company has a specification for bars approximately 5 in. in diameter which they require to be swaged under a hammer; these bars give extremely high physical qualities which they probably believe is due to the swage action. Undoubtedly, however, these qualities are simply obtained on account of the fact that the finishing temperature in this operation is about what it should be for this class of steel.

It will be noted from Mr. Cox's paper that there is no inherent virtue in a press as distinguished from a hammer, as far as the physical condition of the forging is concerned, but an important point is that the tool doing the work should be in proportion to the size of the work done; in other words, we would expect a shaft made under a hammer of the proper dimensions to be very much superior to a forging made under a press which was too light for the work, modifying this statement by the fact that it is practically necessary to make large hollow forgings under the press.

*The Bethlehem Steel Company, New York.

The principal reason we do not get as good a condition in rolled material as compared with forged material is also due to the higher finishing temperature at which material leaves the rolls, the reason for this being, of course, that loss of output and breakage of the rolls would necessarily result from attempting to finish at nearer the proper heat.

Rolled Armor Plate

The rolled armor plate to which Mr. Cox referred in the latter part of his article is rolled by very powerful mills in which the finishing temperature is kept fairly close to what it should be, but even in that case the work does not penetrate to the middle of the masses as well as it would if the plates were forged. It would seem that an axle finished at the proper temperature in the rolls should be at least equal to that made under a hammer if the finishing temperature is the same, because undoubtedly the regularity with which the work is applied from the rolls must be to its advantage.

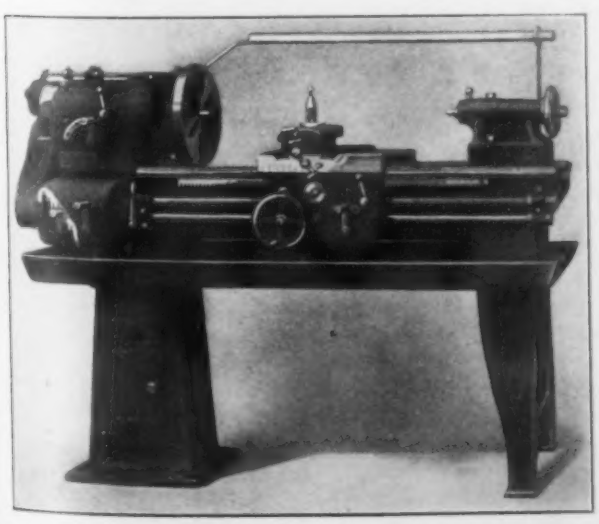
The idea now largely held that scientific heat treatment can correct the effect of improper forgings is very much in line with the idea that improper melting can be cured by adding "medicine" to the ladle.

In conclusion, attention might be drawn to the importance of the fact, as mentioned in the first part of this paper, that the proper melting in the furnace is only a part of the right condition of steel in the ingot as the designs of the molds and the proper method of pouring are equally important.

A 12-In. Precision Toolroom Lathe

A 12-in. toolroom lathe, which has a number of new features as compared with this company's 16-in. tool, has been brought out by the Cleveland Machinery & Supply Company, Cleveland. The new features include a geared headstock, a gearbox arranged for cutting either U. S. standard or metric threads without the use of translating gears, and a relieving attachment that does angular, straight, and taper relieving, both inside and outside.

The bed is unusually heavy for a machine of this size, being designed to give the maximum rigidity. The legs are so placed that they reduce the span between supports for the bed with a view of increasing the stability. The illustration shows the machine with a geared headstock and single-pulley drive, with reversing mechanism in the headstock, giving six speeds forward or reverse. The speed changes are made by the operation of two levers. The starting, stopping and reversing of the spindle are controlled by a shifter rod which runs the entire length of the machine. This rod operates a friction clutch, thus eliminating the necessity of a countershaft.



Heavy Construction and a Gearbox Arranged for Cutting Either U. S. Standard or Metric Threads without Translating Gears Are Two Features of a 12-In. Lathe for Precision Toolroom Work

The gearbox is of the quick change cone type providing for 18 different feeds without changing the gears. The driving mechanism for the lead screw is so arranged that it does not revolve when not in use. The machine is also furnished with a four-step cone pulley and single back gear, and with a three-step cone pulley and double back gears.

The apron is heavy, with all steel pinions. The traverse feed is obtained by a friction clutch, and an interlocking arrangement is provided so that the traverse feed and thread cutting nut cannot both be engaged at the same time.

The machine has bronze taper spindle bearings and is built for cutting either U. S. standard, Whitworth or metric threads. The metric lathe is provided with metric threads on the lead screw, cross-feed screw and spindle nose. A standard arrangement of metric pitches is provided for by a special metric gearbox, instead of compound gears.

Swing over bed, in.	12½
Distance between centers (4½-ft. bed), in.	28
Swing over carriage, in.	6
Diameter of front spindle bearing, in.	1¾
Length of front spindle bearing, in.	2⅝
Morse taper of spindle center	No. 3
Number of spindle speeds	6
Minimum spindle speed, r.p.m.	25
Maximum spindle speed, r.p.m.	425
Will cut threads, metric, mm	5 to 7
Number of feed changes, metric	12
Number of feed changes, English	18
Travel of tailstock spindle, in.	4
Pitch of metric lead screw, mm	5
Pitch of English lead screw, in.	6
Speed of driving pulley, r.p.m.	300
Diameter of driving pulley, in.	6
Face width of driving pulley, in.	1¾
Crated shipping weight, lb.	950

The accompanying table gives the principal dimensions and specifications of the geared headstock single-pulley drive machine:

Spain's Iron and Steel Problem

Official measures to solve the iron and steel problem of Spain have not yet succeeded, according to U. S. Consul-General C. B. Hurst of Barcelona, Spain. In March, 1916, a commission of investigation was appointed and its report led to the embargo of iron and steel mill products as well as scrap until domestic needs were supplied. A board was also appointed to fix maximum selling prices to be published monthly. This board found it impossible to establish the prices on account of irreconcilable differences in valuations of raw materials. Representatives of the pig-iron industry refused to collaborate. Accordingly the government has prohibited temporarily the export of all unmanufactured iron and steel of the present Spanish customs tariff.

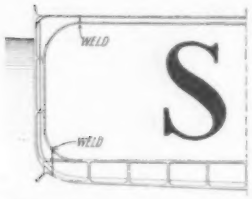
The Ministry of Public Works will conduct an investigation as to the exact cost of production and the capacity of each plant in order to assure the demands of the country. The government, on the suggestion of the Ministry of the Treasury, can grant special permission for the export of some of the products mentioned, but only when the reason for the export is found justifiable. The technical agents of the Ministry of Public Works will determine and regulate the prices of siderurgical products and their distribution throughout the country. Until these experts make their report, prices must remain as they are unless otherwise authorized by the government.

McKinley Memorial Dedication

The National McKinley Birthplace Memorial Association has caused to be engraved a mezzotint of McKinley, which, it is believed, will be a very fine portrait. It is by Frederick Reynolds, and will be sent to subscribers to the life membership fund of the association. J. G. Butler, Jr., Youngstown, president of the association, announces that the memorial building at Niles, Ohio, is practically completed, and the marble statue of McKinley which is to be placed in the building will be finished some time in July. The building will be dedicated and the statue unveiled Oct. 5, when the principal address is to be delivered by ex-President William Howard Taft.

CASTING SHIPS OF STEEL

Electric-Welded Hull Castings to Increase Shipbuilding Without Requiring Rolled Steel



STANDARDIZED shipbuilding with the ships cast of steel is proposed by Myron F. Hill, patent attorney, 45 Cedar Street, New York. The plan is to build the ship hull in sections, each a casting as large as conditions will allow, and to weld the castings together electrically by an arc method. One casting might constitute the bottom of the vessel for a section 8 ft. in the dimension lengthwise of the ship; another casting would form practically one side of the hull for that section, and a third the corresponding side opposite; a fourth casting would form part of the deck framework or the stiffening between the upper parts of the sides. By observing in the welding that the steel is not allowed to get beyond the plastic stage in the heating and that manganese is supplied through the soldering rods, it is claimed that the resultant welded joint has 125 per cent of the strength of the casting itself. The scheme is thus to build a large number of substantially identical sections, so that the work may be carried out on the duplication plan of manufacture, and at the same time it is intended to afford a means of adding rapidly to shipbuilding capacity without depending on the rolling mills, which are already so fully engaged in connection with shipbuilding and locomotive and shell steel orders and for products for other than direct war purposes. Midship sections would, of course, be duplicated to a large extent, and then for the corresponding parts of standardized ships the identical castings would be used.

Ten Yards for 6,000,000 Tons of Ships Annually

Mr. Hill talks of his shipbuilding project in terms of 6,000,000 tons of shipping per year. In view of the fact that the open-hearth capacity of the country is well occupied with present demands, including the manufacture of stern posts, locomotive parts, etc., he considers that the building of new open-hearth plants for the special purpose of building ships is essential. As a preliminary estimate, he considers that ten foundry shipyards should be considered, located where water for launching is available as well as fuel, ore and labor.

From the ideal standpoint he would provide blast furnaces at the shipyard, so that molten metal from the furnaces might be taken to the open-hearth furnaces. Each yard would be equipped with about 50 open-hearth furnaces of 25 to 30 tons capacity each, to secure 50,000 tons of shipping per month in each such plant. He has made a brief survey of the possibilities of getting refractory material, furnace charging machines and traveling cranes and other equipment, and believes that the foundry shipyards may be built in about five months. If blast furnaces are constructed, present resources of pig iron are to be drawn upon until the furnaces are ready.

The general plan of each plant is to be such that the steel castings are to be assembled on the ways and there electrically welded; then beyond the ways, or in slips, the upper portions of the hulls may be completed and the engines installed while the hull is afloat. The abutting edges of castings are beveled to form the V-shaped grooves usual in electric welding, and by means of interlocking lugs and overhanging ends, the cast sections are drawn together to bring the edges into exact registration, to be welded electrically with the operative in some cases, for example, working from swinging seats. The welding metal is deposited into the V-groove across an arc from a rod composed of an alloy containing enough manganese to secure a joint of strength greater than the cast steel and yet ductile, such a weld, Mr. Hill claims, being possible with the system of the Wilson Welder & Metals Company, New York.

Labor and Equipment Needed

In size of castings, sections 8 x 30 ft. and even larger are spoken of. The grooves are on the inside of the hull, leaving the outside of the ship without projections other than the minute ones corresponding to the surface of a steel casting untouched from the sand. The only work contemplated on the outside is the removal by chipping of the steel fins following the use of built-up forms of mold, which may be used for the large castings. Sharp projections from the inside may be removed to avoid injuring a workman. The inner skin of the vessel, to form bulkheads, tanks and bunkers, may be composed, Mr. Hill suggests, of rolled sheet metal welded to the decks, beams, frames and plating. It follows, of course, that the castings will have reinforcing ribs to secure strength to the hull itself as well as to provide for satisfactory casting results.

It is estimated that about 100 men can assemble 50,000 tons of shipping in each plant per month; this means a 10,000-ton ship, for example, about every five or six days in each one of the ten plants. Three ways per plant are suggested, each with its slip, and twelve traveling cranes for each plant. As the surface of the castings will not be so smooth as that of rolled steel, the plan would be to coat the surface with red lead and smooth with liquid cement. Green labor, it is said, with skilled foremen may be utilized. Such have been trained to weld in less than three weeks. For each shipyard 2160 welders could weld one hundred 5000-ton ships per month, these comprised in three shifts of 720 men each. For these 750 welding outfits would be necessary, taking 3500 kw.

Some Advantages Claimed for Cast Ship

The cast-steel ship is suggested as getting an opportunity to furnish a large supply of ships without further straining the steel rolling capacity of the country and that the direct cost in well-organized shipyard foundries would be less than the cost of fabricated ships in times of peace. Emphasis is placed on the minimum resistance to friction of the ship's hull owing to the absence of riveted joints and to the fact that the higher silicon content of cast steel is calculated to give maximum resistance to surface corrosion. Emphasis is also placed on the fact that the welded joints are stronger than the average section of the steel casting, while with riveted structures the weakest points are the riveted joints. It is mentioned to point out the feasibility of the scheme that German submarines are built of cast-steel sections. The casting of the sections is regarded as no great problem, being a standard commercial product, nor the electric welding, being merely the application of a standard commercial process on a large scale.

A consulting engineer on request has recommended that the Shipping Board spend $10,000 in experiments and a marine architect has approved an expenditure of $50,000 for trying out the scheme.

Italy's Iron and Steel Imports

Italian imports of pig iron and steel in 1916 as compared with recent years are reported as follows:

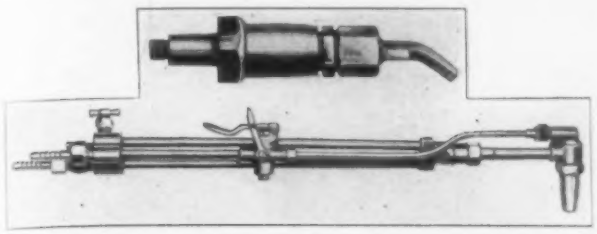
	1914	1915	1916
Pig iron	219,995	240,535	302,333
Scrap	254,892	261,468	342,706
Ferroalloys	7,368	11,025	8,780
Ingots and blooms	17,416	64,032	25,982
Bars, rods and shapes	95,886	72,470	159,552
Sheets and plates	33,529	22,232	24,668
Rails	5,251	1,871	10,469
Wire	2,786	2,132	2,167

The increased imports last year of pig iron scrap, bars, rods and shapes is marked, the increase coming chiefly from the United States.

The Glover Machine Works, Marietta, Ga., will soon have in connection with its plant a steel foundry and forge shop. An electric furnace, steam hammers, sand blast machinery, grinders, and sand mixing machinery will be installed. The company specializes in industrial locomotives.

Oxy-Acetylene Rivet Cutting Torch

A special rivet and staybolt cutting attachment designed to permit rivet heads and staybolts to be cut off flush with the plates by the oxy-acetylene torch has



A Special Attachment Designed to Direct the Oxy-Acetylene Flame Into a Path Parallel with the Plate Enables Rivet Heads and Staybolts to Be Cut Off Flush by the Ordinary Torch

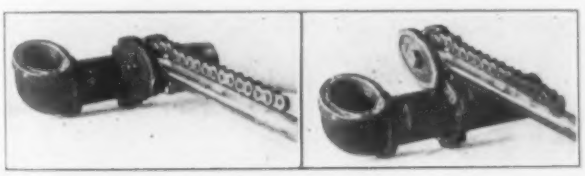
been developed by the Prest-O-Lite Company, Inc., Indianapolis. The attachment is intended for use in connection with a standard cutting torch and is screwed into the head in place of the regular cutting nozzle.

The copper tip is bent at an angle to permit the gas jet to play parallel with the plate. In this way it is emphasized that cleaner work is possible than is the case with an ordinary cutting tip where the cut is not truly parallel with the plate. The tip can also be adjusted, thus facilitating operations in close quarters.

Special Type of Chain Wrench for Pipe

A double-acting chain pipe wrench has been placed on the market by the Billings & Spencer Company, Hartford, Conn. In addition to permitting pipe to be turned in either direction without removing the wrench and turning it over, it is adaptable to pipe fittings and short connections, and, of course, ordinary pipe. By removing the outside jaws a combination tool for narrow or irregular work is provided, as well as for nuts and bolt heads.

The jaws of the wrench are elliptical in outline, thus enabling either the inner or outer teeth to be brought



Pipe Fittings, Short Connections and Ordinary Pipe Can Be Screwed Up or Loosened and by Removing the Outer Elliptical Jaws the Wrench Is Available for Narrow or Irregular Work, as Well as Nuts and Bolt Heads

into engagement. The jaws are serrated on all sides, which, it is emphasized, gives double life to the wrench, as the jaws may be changed end for end readily.

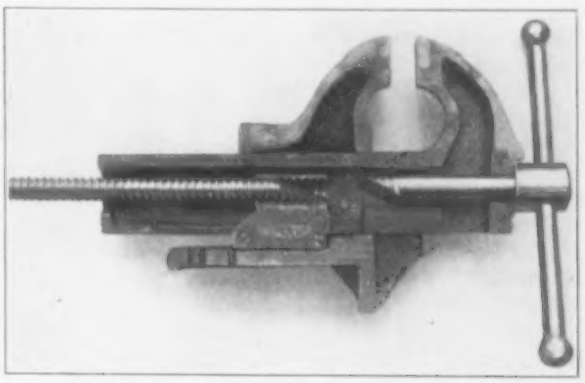
The American Society of Heating and Ventilating Engineers is to pay attention to subjects of special importance to the country at this time at the meeting which it will hold in Chicago on July 18, 19 and 20. There will be a military session at which papers will be read on the heating of the cantonments and one on shop organization and business efficiency, to show how manufacturers can render service to the Government. There will be a drying session for consideration of the methods of preserving vegetable and food supplies by accelerating drying. A committee of the society is co-operating with the Government on questions of ventilating, humidifying and heating battleships.

The Westinghouse Electric & Mfg. Company, Pittsburgh, is arranging with British interests for the sale of its controlling stock interest in the English Westinghouse Electric & Mfg. Company. The pending transaction is based upon an agreement under which the interests of British and American companies will be closely allied, so that the engineering skill of both companies will be most effectively put to use in the markets of the world.

Machinists' Iron Vise with Hollow Jaws

A machinists' vise made of hollow malleable iron and designed for hard service has been brought out by the Columbian Hardware Company, Cleveland. It is made in various sizes with from 2 to 8½ in. jaws and with both flat and swivel bases.

Both the front and rear jaws are of malleable iron and all parts are cored to a nearly uniform thickness so that they will be thoroughly and uniformly annealed. The core is relied upon to provide a skin on both the inside as well as the outside of the parts and assure the maximum strength of the metal. The thickness of the section ranges from 9/16 to 11/16 in. The screw is forged steel and the handle is tool steel. The handle ends are forged instead of riveted, making the handle a solid piece of steel. The malleable jaws are faced with



Hollow Malleable Iron Jaws and a Cored Body Are Relied Upon to Give a Thorough and Uniform Annealing to the Various Parts of a Recent Machinists' Vise

tongued and grooved steel pieces, which are fastened to the jaws with screws so that they can be replaced or redressed when worn.

Will Operate Kentucky Furnaces

The Suwanee Iron Company has been organized to operate the two blast furnaces at Grand Rivers, Ky., recently purchased from J. M. Overton, president of the Alabama Fuel & Iron Company, Stahlman Building, Nashville, Tenn., and associates. It is expected that one furnace will be lighted July 1, and the second about six months later. Most of the ore will come from the Russellville, Alabama, district, but some native ore will be used. The properties were a part of the holdings of the Hillman Land & Iron Company, and were last active in 1903.

Takes Over Steel Castings Plant

The American Locomotive Company has purchased from the Penn-Seaboard Steel Corporation, the Seaboard Steel Casting Company's plant at Chester, Pa., which has a capacity of about 18,000 tons of steel castings a year. The plant is located on the Delaware River, with a water frontage of about 1000 feet, and is in full operation.

Hand squeezers are the subject of a 24-page pamphlet which constitutes bulletin No. 6 issued by the committee on foundry methods of the National Founders' Association, 29 South La Salle Street, Chicago. Besides generously illustrated descriptions, including pattern and flask equipment, the information covers such topics as the teaching of laborers, the oversight of the foreman, directions for making squeezer plates and the importance of time studies.

The Non-Rust Terne Plate Company has been formed at Philadelphia to manufacture terne plate by a process developed by Thomas Stamford. The company thus far has no plant of its own. George W. Williams is president, Thomas Stamford vice-president, and Henry R. Wormick secretary and treasurer. Mr. Wormick's address is 4461 Edgemont Street, Philadelphia.

Proposed Safety Code for Ohio Industries

Iron and Steel and Metal-Working Companies Active in Its Preparation — To Be Used in Conjunction with Steel Works and Foundry Codes

A new general safety code for Ohio, providing safety regulations for all factories and work shops, has been prepared by the General Standards Committee of that State, of which H. J. Weeks, district safety inspector of the American Steel & Wire Company, is chairman. The committee that prepared the code was appointed by the Safety Committee of the Industrial Commission of Ohio. It will probably hold three public meetings on the proposed code—in Cleveland, Cincinnati and Dayton—to give Ohio manufacturers an opportunity to present any objections to its provisions. After the hearings the standards adopted by the committee will go to the advisers and Industrial Commission, and the Commission will put the code in effect.

The committee has made an exhaustive study of the subject, this including visits to manufacturing plants and investigation of safety regulations, and workmen's compensation standards in various States, and has spent much time in preparing this code, which it is expected will be approved by the Industrial Commission without important modifications. This code will fit in with two other codes that have been prepared in Ohio, one for steel plants and the other for foundries, which the Industrial Commission has not yet put in effect. The proposed code is as follows:

General Safety Standards

Definition: "Old installations," as used in this code, shall be interpreted to mean installations or constructions built or contracted for previous to the issuance of this code by the Industrial Commission of Ohio.

Section 1. *Standard Railings.*

a. Standard railings shall be not less than 42 in. in height, except for old installations which height shall be not less than 36 in., and shall be provided with an additional rail midway between the top rail and the floor and shall be smooth and free from protruding nails, bolts and splinters.

b. If constructed of pipe, they shall be not less than 1¼ in. standard gage pipe.

c. If constructed of structural material or bars, it shall be equal to or greater in strength and rigidity to a railing constructed of 1½ x 1½ x 3/16 in. angle top rail and vertical posts or uprights, and ¼ x 1 in. bar intermediate rail.

d. If constructed of wood, the posts or uprights shall be not less than 1⅞ x 3¾ in. or its equivalent section, and rails not less than ¾ x 5½ in. or its equivalent section. These dimensions are net finished sections.

e. Posts or uprights shall be spaced not more than 8 ft. apart.

f. One or more sides may be hinged, preferably with self-closing gates. If desired, removable sections in sockets may be used.

g. Where railings are solid or paneled, middle rail may be omitted.

Section 2. *Standard Toe Boards.*

a. Standard toe boards shall be not less than 4 in., net, in height, of wood, metal or other substantial material.

Section 3. *Elevated Runways and Platforms.*

a. Elevated runways and platforms 5 ft. or more from floor or ground level shall be provided with standard railings except when operation makes this impracticable.

b. Elevated runways and platforms 6 ft. or more from floor or ground level, where passage underneath is possible, shall be provided with standard toe boards.

c. Openings for drainage, ventilating, etc., in floors, elevated runways and platforms 6 ft. or more from floor or ground level, where the safety of persons below is involved, shall be not greater than 1 in. in width.

d. Elevated runways or platforms made of two or more planks, with end supports 5 ft. or more apart, shall be fastened together with one or more cleats underneath, screwed or bolted to planks.

e. Elevated runways made of single plank must be supported at least every 5 ft.

Section 4. *Stairs.*

Definition: Four or more risers or a series of risers between landings shall be considered a flight of stairs.

a. Standard handrails for stairs shall be not less than 36 in. nor more than 42 in. in height for new construction and not less than 30 in. or more than 42 in. for old construction, measured vertically from the center of tread, and shall be smooth and free from protruding nails, bolts and splinters.

b. Except in old installations, in any one flight of stairs all treads shall be of the same width and all risers of the same height.

c. Hand rails shall be provided on both sides of stairways, open on both sides.

d. Hand rails shall be provided on both sides of all stairways 3 ft. or more in width.

Section 5. *Floor Openings.*

e. All permanent floor openings, not including hoistway openings, shall be guarded with standard railings and, where the safety of persons below is involved, with standard toe boards, or with fixed safety covers with flush hinges. When safety covers are used, the unused sides of the openings shall be protected.

Section 6. *Wall Openings.*

a. Wall openings shall be protected by standard railings and toe boards, or, in lieu of same, with doors or gates not less than 42 in. high and extending to bottom of opening.

Definition: Wall openings shall be understood to mean openings in walls from which there is a clear drop of 6 ft. or more, and shall include openings giving access to yardarms or block and tackle, doorways and other openings 30 in. or more in height and 18 in. or more in width, the sill or lower edge of which is within 24 in. of the floor or platform level. Windows shall not be considered as wall openings except when located at the foot of any flight of stairs or at any platform on stairs.

Section 7. *Set or Train of Gears.*

Definition: A set or train of gears is two or more gears that move and intermesh.

Exception: Adjusting gears which do not normally revolve shall be exempt from the requirements of this section.

a. All or any part of a set or train of gears exposed to contact shall be completely inclosed or have a band guard around face of gear, with the side flanges extending inward beyond the root of teeth.

b. Frictional disk drives shall be guarded in the same manner as provided for gears.

c. Guards shall be of substantial construction securely fastened in place and of such design and arrangement that an arm or hand cannot project through, over, around or underneath guard and be caught in mesh-point of gears or between gear teeth and adjacent framework or other fixed part, or be projected through gear where latter has openings between the arms or through the web.

d. Where a guard or enclosure is within 4 in. of the gears and there are openings through the guard more than ½ in. in width through which fingers might

project and be injured by the gears, such openings shall be completely covered or protected by substantial material of not more than ½ in. openings.

Section 8.

a. *Clutch, pulley, sprocket or coupling*, including pulley or clutch driving working machine belt, 6 ft. or less above floor or platform, shall be completely inclosed or protected by standard railing.

b. Railings 15 in. or less from any moving part shall be paneled with sheet or perforated metal, wire fabric, wood or grille.

Section 9. *Vertical and Inclined Belts.*

Definition: Rope or chain drives shall be considered belts.

a. All belts 6 ft. or less above floor or platform shall be substantially guarded, as follows: 1. Shall be completely inclosed to a height of 6 ft. above floor or platform. 2. Or be inclosed by standard railings, no part of which is less than 15 in. from belt or pulley. 3. Or if without metal fastenings, by a guard completely inclosing belt and pulley to a distance 1½ times the diameter of the pulley measured from the center of the shaft.

Section 10. *Horizontal Belts.*

Definition: Rope or chain drives shall be considered belts.

a. Horizontal belts 6 ft. or less above floor or platform shall be substantially guarded as follows: 1. If upper part is 6 ft. or less above floor level or platform, to be completely inclosed on top and sides, or inclosed by a standard railing located at least 15 in., measured horizontally, from the edge of the belt. 2. If lower part of the belt is 6 ft. or less above platform or floor and the upper part is more than 6 ft. above platform or floor, the lower part shall be guarded on bottom, sides and ends to a height of 6 ft. above floor or platform, or inclosed by standard railing located not less than 15 in., measured horizontally, from the edge of the belt.

b. Where passage between upper and lower parts of belt is necessary, passageway shall be guarded on sides, top and bottom.

Section 11. *All revolving shafting*, 3 in. or less in diameter, located 6 ft. or less above the floor or platform, shall be completely inclosed to a height of 6 ft. above the floor or platform, or otherwise guarded.

Section 12. *All keys, set screws* and other projections protruding beyond the surface of revolving parts, when exposed to contact, shall be protected.

Section 13. *Machinery Control.*

a. A means must be provided at each machine for disengaging it from the source of power.

b. All tight and loose pulleys must be equipped with a permanent belt shifter provided with mechanical means designed to prevent belt from creeping from loose to tight pulley.

c. All cone pulleys shall be equipped with mechanical belt shifters permanently attached.

d. Every room or department shall be provided with a means of disengaging the machinery in that room or department from the source of power.

Section 14. *Flywheels.*

a. Flywheels and balance wheels located 6 ft. or less above floor or platform shall be inclosed with any one of the following guards: 1. With a standard railing placed not less than 15 in. or not more than 18 in. from side of rim. When flywheel extends into pit, a toe board not less than 4 in. in height shall be provided. 2. With an inclosure of sheet or perforated metal, wire fabric or wood, when less than 15 in. from side of rim, to a height of 6 ft. When the wheel is less than this height, the guard need not extend above the wheel. *Note:* It is recommended that when the upper rim of the flywheel protrudes through a working floor to a height of 30 in. or less, it shall be entirely covered. 3. For flywheels 5 ft. or less in diameter, the following may be used: A substantial disk attached to the wheel in such a manner as will protect the spokes of the wheel on the exposed side and present a smooth surface. An open space not exceeding 2½ in. in width may be left between the outside edge of the disk and the rim of the wheel if desired to facilitate turning the wheel over. Where a disk is used, any keys or other dangerous projections, not protected by disk, shall be cut off or guarded.

Section 15. *Ladders.*

Definition: All ladders not permanently attached shall be considered portable ladders.

a. All portable ladders, except step-ladders, shall be equipped with safety shoes, metal spikes or spurs. Safety shoes shall be surfaced with cork, carborundum, alundum, rubber or other material with approximately the same coefficient of friction.

b. All permanent ladders, except ladders on smokestacks, extending to a height of 20 ft. or more, shall be arranged to have a confined climbing space of dimensions not less than 25 x 25 in. or greater than 30 x 30 in. Where vertical members are used as supports, not less than five shall be used, spaced equal distances apart. These measurements to be taken in the plane at right angles to the ladder. *Note:* Exit from ladder confinement shall not be over railings. Ladder confinement may be considered standard railing at exits.

c. Where ladder is so located that it would be possible to ascend without entering the inclosed climbing space, a baffle shall be installed designed to prevent ascent on exposed side of ladder.

Section 16. *Boiler Walks.*

a. Where two or more boilers are placed side by side, there shall be a continuous footwalk at the top of the boiler from one end of the row to the other. This walk shall have standard railings on at least one side throughout its entire length, and where the walk passes over open spaces between boilers, etc., there shall be a standard railing and toe board at both sides.

b. Stairways or permanent ladders (stairways preferred) shall be installed to furnish access to each end of the footwalk. *Note:* Where the top of the boiler is smooth and reasonably free from obstructions, it may form a part of the footwalk, but must be provided with a railing connected with the railings on the footwalk between the boilers so as to form a continuous passageway from one end of the line to the other with no openings or breaks in the railing more than 30 in. in width.

c. For high vertical boilers, such as the Cahall type, there shall be an additional longitudinal footwalk with standard railing and toe board, this walk placed at such a height as will give convenient access to the water columns.

Section 17. *Counterweights.*

a. Provision shall be made to afford protection from the movement or falling of suspended counterweights. Where the danger is only from the falling of the counterweight caused by the breaking of the supporting cable or other suspension, an auxiliary safety cable or chain will be considered sufficient protection.

The members of the code committee, in addition to Chairman Weeks, are J. M. Woltz, director of safety, Youngstown Sheet & Tube Company, Youngstown; Oscar McNab, Safety Service & Engineering Company, Cleveland; Harry T. Vollmer, Ohio Federation of Labor; E. R. Rose, secretary of the Republic Iron & Steel Company's general safety committee; F. G. Bennett, director of safety, Buckeye Steel Casting Company, Columbus; John Graney, Federation of Labor, Youngstown, and E. J. Russert, Sharon Steel Hoop Company. As advisers to the committee were Victor T. Noonan, director of safety, Industrial Commission of Ohio; C. E. Pettibone, safety and welfare director, Pickands, Mather & Co., Cleveland; and A. C. Cook, director of claims, Carnegie Steel Company.

Arthur G. McKee & Company, consulting and contracting engineers, Cleveland, recently have taken the following contracts for blast furnace work: The erection of new bins and trestles for the Lawrence furnace of the Marting Iron & Steel Company, Culbertson, Ohio; a Brown pig breaker, hydraulic pump and pump house equipment for the Pulaski Iron Company, Pulaski, Va.; revolving distributers and complete top distributing system, including small direct current power plant for motor drive for the distributers, for the two Rockwood furnaces of the Roane Iron Company, Rockwood, Tenn.

Freight Cars to Be Owned by Government

Council of National Defense Has Important Project—Car Builders Summoned to Washington—Appeal to Manufacturers Issued—General Goethals Wields the Ax

WASHINGTON, June 11, 1917.—The Council of National Defense has evolved a project which will be of great importance provided Congress can be induced to supply the money necessary for its execution. It is proposed that the Government shall purchase 100,000 freight cars to be owned by the United States and operated under the direction of the President on all the railroads of the country. It is estimated that this equipment will cost not less than $150,000,000. A number of representatives of the larger car-building corporations have been summoned to Washington to confer with the council and several preliminary discussions have taken place. Railway authorities are said to have advised the council that "the nationalization of the roads as proposed by pending legislation will prove ineffective unless more equipment is provided."

Strong opposition is developing to the pending legislation authorizing the President to direct railroad traffic and to decree that preference shall be given by common carriers to certain commodities. Bills providing this authority have been reported in both houses, but are being stubbornly fought on the ground that they not only place dictatorial powers in the hands of the President, presumably to be delegated by him to some commission, but also effect the practical repeal of the interstate commerce laws and suspend the functions of the Interstate Commerce Commission. Efforts are being made to modify the pending measures in the hope that the opposition will be withdrawn, as the President is very anxious that this legislation should be enacted at the earliest possible moment.

Special Committee's Appeal

The special committee on national defense of the American Railway Association, composed of Fairfax Harrison, chairman; Howard Elliott, Hale Holden, Julius Kruttschnitt, and Samuel Rea, has issued the following appeal to manufacturers and shippers seeking co-operation in meeting transportation problems growing out of the war:

The special committee on national defense of the American Railway Association invokes the support of all persons and concerns, for unless the railroads operate as one system and make economic changes which may result in inconvenience to the public, the equipment, present and attainable, of the railroad lines will be insufficient to meet the demands to be made upon it.

There are 2,500,000 freight cars in the United States and their capacity is barely sufficient for commercial needs. The railroads in the near future will use 120,000 cars to transport material for the construction of the "new army" training camps, and a continuous flow of cars to keep those camps in supplies. They estimate that it will take 200,000 cars to carry the material which will enter into the construction of the Government merchant ships, whether of steel or of wood. They will require an enormous number of cars to move the steel for the ships under construction for the Navy, and no estimate whatever can be made of the number of cars which will be needed to carry the material used in the manufacture of munitions and supplies for the Army, and in moving them a second time from the point of manufacture to the shipping point.

The railroads have adopted, as the fundamental principles on which to secure the desired results, increase of efficiency, economy of effort, and the elimination of competition; in other words, by patriotic co-operation to operate as if they were one great corporation, intent upon securing the greatest results at the least expense of effort and of money.

Where lines were competing, some of the trains are being and more will be withdrawn. The number of trains for commuters will be reduced in order to spare the engines and crews for the freight service. At terminals all loaded cars may be sent over one line and the empties sent back over its rival line to give the railroad men the opportunity for free movement of trains.

In this connection, the Department of Commerce states that in answer to a circular letter addressed by the department to 7000 trade organizations throughout the country, urging maximum capacity loading of freight cars to assist in reducing the car shortage, replies are now coming in "showing a gratifying spirit of co-operation on the part of the shippers and organizations." The department also calls attention to the desirability of eliminating all delays in unloading, which will also release many cars, and expresses confidence that "the co-operation of the local trade organizations and the enlisting of the enthusiastic spirit of other members will do much to alleviate the situation and release many thousands of freight cars that are now needed as they never were before."

Co-operative Committees

The Council of National Defense announces the appointment of co-operative committees on railway cars and locomotives to serve with the committee on transportation and communication of which Daniel Willard, chairman of the advisory commission of the council, is the head. S. M. Vauclain, vice-president of the Baldwin Locomotive Works, is chairman of both co-operative committees, the membership of which is as follows:

Co-operative committee on cars—E. F. Carry, president Haskell & Barker Co.; Charles S. Gawthrop, vice-president American Car & Foundry Co.; Clive Runnels, vice-president The Pullman Co.; R. L. Gordon, assistant to president Standard Steel Car Co.; A. S. Reeder, vice-president Pressed Steel Car Co.; S. P. Bush, president Buckeye Steel Casting Co.

Co-operative committee on locomotives—Andrew Fletcher, president American Locomotive Co.; H. P. Ayres, vice-president H. K. Porter Locomotive Co.; Joel Coffin, chairman Lima Locomotive Corporation.

It will be the function of these two committees to assist in solving the problem of increasing the American output of cars and locomotives through co-ordination of the efforts of manufacturers, and to aid in making as efficient use as possible of existing rolling stock. Their duties have been made unusually important through the demand of the allied countries, particularly France, Russia and Italy, for American railway supplies.

Tremendous Appropriations

The special session of the Sixty-fifth Congress, now a little more than two months old, has already planned appropriations aggregating the stupendous sum of $5,000,000,000, of which no less than $4,285,867,000 have been allotted in bills which have passed both houses and which have received the President's approval or are still in conference committee. Among the largest items in this great total are the so-called war budget bill, $3,381,294,541; regular army bill, $278,000,000; regular naval bill, $517,000,000; fortifications bill, $51,000,000; sundry civil bill $16,000,000; general deficiency bill, $147,000,000, and military academy bill, $300,000. To meet these expenditures, Congress already has authorized a bond issue of $2,000,000,000 to which will be added $1,000,000,000 of short-time treasury certificates, while the taxation contemplated in the pending war revenue bill will provide about $1,500,000,000 additional. Current revenues from usual sources will supply about $700,000,000, leaving a small margin of safety for the year.

The passage of the big war budget bill has again been delayed as the result of the insistence of Secretary Daniels upon an appropriation of $3,000,000 for the purchase of the old Jamestown Exposition site and buildings and the construction of a naval base and training station there. With this item eliminated there is no further controversy concerning the war budget

measure, which will probably receive the President's signature within two or three days.

Subordinates Discussed

General Goethals, general manager of the Emergency Fleet Corporation, has cut the gordian knot in the controversy over the respective merits of steel and wood as materials for the big fleet of cargo carriers planned by the United States Shipping Board by summarily dismissing F. A. Eustis, assistant general manager of the corporation, and F. N. Clark, an advisory engineer, the original sponsors of the wooden ship building program. This new upheaval came as a surprise after the differences between General Goethals and Chairman Denman, growing out of the General's remarks at the recent meeting of the American Iron and Steel Institute, had apparently been composed.

General Goethals has appointed Admiral H. H. Rousseau, U. S. N., assistant general manager of the Emergency Fleet Corporation to succeed Mr. Eustis, and Samuel L. Fuller as assistant to the general manager, the post held by Mr. Clark. Concerning Mr. Fuller's appointment General Goethals says:

"Mr. Fuller is volunteering his services. He has had extensive experience in the investigating of projects and in financing. I am going to utilize him in looking into the financial standing of people who want to undertake the construction of ships, both steel and wood. He will also be used in appraising ships that are now on the ways that we will probably take over under legislation now pending in Congress."

It is stated at the headquarters of the Shipping Board that a large number of wooden ships will be built on designs approved by General Goethals and that already contracts for 160 such ships have been let, 100 to the Southern Pine Association and 60 to the different firms on the Western coast, with an option of 40 more at the same price.

International Purchasing Plans

While the delay of Congress in acting on the war budget bill has had the effect of slowing down the developments of the plans for the International Purchasing Commission, which is to buy war supplies for this Government and the Allies, considerable progress has been made both in this country and abroad. It is now understood that the interallied commission in Europe will determine the needs of England, France, Russia, Italy, and Japan, which will be communicated to representatives of this commission to be located in the United States, who will in turn submit them to the international commission, which is to be under the direct control of the American Government. The available supplies of the desired materials will be allotted by the international commission, which will act as contractor for all parties and as such will have complete control of prices, distribution and deliveries. It is further announced that no more contracts for the French or British governments will be signed with private American concerns, and it is assumed that the other allies will pursue a similar course. The members in the United States of the interallied commission will maintain headquarters both in New York and Washington and will co-operate heartily with the international commission under American control.

The Department of Commerce announces that as the result of a meeting held during the past week and attended by the representatives of the tin industry at the office of the Bureau of Foreign and Domestic Commerce, the American Iron and Steel Institute has been asked to call a conference to form an organization "to be responsible to the Bureau for the equitable allotment of pig tin in this country." It is understood by the Department that the British Government has signified a willingness to turn over this important duty to the department with the stipulation that a competent committee will be appointed to handle the allotment.

W. L. C.

The Mahr Mfg. Company, Minneapolis, Minn., manufacturer of oil-burning equipment, has opened a branch office at 120 Liberty Street, New York, in charge of John R. Matthews.

PLATE MILL FOR YOUNGSTOWN

Sheet & Tube Company Additions Will Largely Increase Finishing Capacity

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has decided to add a large plate mill to its plant, and also is considering other large additions, decision on which will likely be reached in a short time. The new plate mill is to be an 84-in. tandem type, motor driven throughout. Its capacity is estimated at from 12,000 to 15,000 tons per month, and it will be used principally to provide material for the larger sizes of lap-weld pipe, requiring skelp between 45 in. and 72 in. in width.

The unit will include four continuous furnaces, and will be housed in connected buildings, which for the purpose of description may be divided into five sections. The slab building will be 80 x 140 ft., the motor building 80 x 140 ft., the conveyor building 80 x 540 ft., shipping building 80 x 320 ft., furnace and mill building 80 x 280 ft., and these buildings will all be of structural steel with corrugated iron roofing and siding, except the motor building, which will be of brick construction with composition roof. The Blaw Steel Construction Company, Pittsburgh, will erect the structural steel, the Mesta Machine Company will furnish the mill and tables, the shear and levels will be furnished by Hilles & Jones, of Wilmington, Del., the larger motors will be made by the Allis-Chalmers Mfg. Company, and the smaller motors by the General Electric Company, the cooling table will be erected by Heyl & Patterson, Inc., and the furnaces by Alex Laughlin & Co., both of Pittsburgh. It is expected that the new unit will be in operation within 12 months. The order has not yet been placed for the cranes. The buildings will be located near the west end of the plant, west and south of the present tube mill department. The company will do all the excavating for the new mill itself, and also other minor work. The 12-in. Morgan mill, under erection for some months, is about completed, and will start in a short time.

Last week the Youngstown Sheet & Tube Company awarded contracts for apartment houses at East Youngstown to contain about 100 3-room and 4-room suites, as well as a large number of houses, both brick and frame, in connection with its housing project. Contracts already let will provide for the housing of several hundred families. The housing program contemplates at least 1000 structures. The company also placed an order recently for 100 cars, which will be used for mill interchange service. At present the company owns about 50 cars, and uses many belonging to the railroads.

British Manganese Ore Imports

Manganese ore receipts into Great Britain in April, 1917, were only 24,904 gross tons, comparing with 45,500 tons in April, 1916. The total to May 1, 1917, was 122,597 tons against 132,598 tons to May 1, 1916. Shipments have been larger, however, than in the corresponding period in 1915, when the total was only 102,019 tons to May 1, 1915. The April receipts this year were the lowest for any month thus far and the average monthly imports to May 1 this year, of 30,649 tons, is less than the 1915 and 1916 rates, which were 31,060 tons and 36,625 tons respectively.

Opening Iron Mountain Mine

The Iron Mountain Mining & Smelting Company, Iron Mountain, Mo., has taken up the Iron Mountain mine at that place and expects eventually to be able to ship about 2500 tons of iron ore per month. The company is now sinking new shafts and hydraulicking. Franklin M. Smith is president; W. R. West, vice-president and general manager, Joseph T. West, secretary, and F. J. McKee, treasurer.

Employees of the Janesville Iron Works, Hazleton, Pa., have purchased $20,000 worth of Liberty bonds.

ESTABLISHED 1855

THE IRON AGE

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The Pig and Scrap Advances

The high prices recently attained by pig iron and scrap are surprising chiefly by reason of buyers and sellers having gotten into a particular frame of mind, with which these advances do not comport. Until recently the great advances in the market have been in steel. In 1912 and 1913 there was a great deal of new steel works erection and predictions were freely made that the next time the steel industry undertook to operate at capacity it would find itself short of pig iron. Then came the remarkable performance of the blast furnaces in 1915, whereby in September of that year the coke and anthracite stacks exceeded a rate of 100,000 tons daily, a rate well in excess of estimates. Steel prices rose rapidly, while pig iron advanced but little, only $5 or $6 a ton up to last September. Without any specific mental process it was assumed that the rise in prices was to be confined chiefly to steel. There was not enough steel capacity for the demand, hence any price might be reached by steel.

If, however, there were not enough pig iron for the demand, not enough to operate foundries and steel works that had high priced orders, then pig iron could advance to the selling price of the more finished product, minus the cost of conversion. If there had been at the outset an alignment whereby there was not enough blast furnace capacity for the steel works, the advances at the outset would have been in pig iron, merely pushing steel prices before it, and then we might have been surprised later by steel running away from pig iron.

The pig iron and scrap markets are now acting as if the supply might prove insufficient for the steel works. This would mean, presumably, that before any steel capacity is shut down and works organizations impaired, the highest price would be paid for pig iron or scrap that involved no actual money loss. The profit would be transferred from the steel-making department to the blast furnace, a matter of no more than bookkeeping, if as much, in the case of the integrated companies, but a very different matter with the merchant furnaces and the detached steel works.

The scarcity of pig iron and scrap is due to two causes: first, the much greater new construction of steel-making capacity than of blast furnace capacity, partly due to building plans having diverged and partly to the greater difficulty of building a blast furnace than an open-hearth steel furnace, and, second, the scarcity of coke whereby production of pig iron was greatly curtailed in the winter and somewhat curtailed even in the past couple of months. Our blast furnace reports have shown an average daily production during April and May of 110,700 tons, against an average of 111,700 tons in October and November, although more stacks have been in blast.

These two conditions, however, are not necessarily permanent. There are many blast furnaces in course of erection, and in time they will come in, but the time is uncertain. And there is also to be considered the long and hard driving of many blast furnaces and their need of going out for repairs. Again, the coke supply may be made sufficient. The car situation in the Connellsville coke region, which has been the root of the curtailment in pig-iron production, received scant attention from the authorities at Washington until the conference of last Friday between the Car Service Commission and representatives of the manufacturers interested. There is a possibility of conditions being greatly improved in the matter of coke production and movement.

Munitions and Metal Working Plants

Metal-working plants, speaking of them as a class, have wanted to get busy making war munitions ever since a state of war existed. Many of them had more or less to do with making shrapnel and other shells and shell parts for the Allies; they knew the difficulties of getting under way and had learned how expected large profits did not materialize. The attitude has been for some weeks that Washington is too slow to take advantage of the manufacturing facilities of the country. Manufacturers are desirous of doing their share but with all the serious problems they are facing in the matter of materials, labor, transportation, war taxes and insistent demand, they have been concerned over being able to supply the Government without unduly delaying deliveries on their regular business.

It seems probable that orders will be distributed as early as it is possible or necessary. A brief sojourn in Washington leads one to believe that with the many capable men there engaged in

assisting the Government, haste is being made slowly. The vital matter of gages, drawing from the experience with European contracts, is well recognized, and it is a safe guess that our own manufacturers, when we enter on large scale operations, will have a measure of protection in this respect which they did not have earlier.

A matter on which our prospective shell makers are not so well fortified is the profits they will have. They recognize that these must be moderate. They are willing that munition business should be awarded on the basis of competitive bidding, but they consider that when successive lots are let at higher unit prices, owing to the influence of general conditions, they should not be penalized for taking the early contracts. They hold that there should be horizontal increases in unit prices to bring up the unmanufactured portions of their contracts to the new level of the later contracts. They draw a parallel to the fact that subscribers for the first national loan will automatically secure an increased interest return if conditions are such that a subsequent issue of Government securities requires an increased interest rate.

Meanwhile, it seems worth while to suggest to metal working plants that they may assume that the way to shell making will not be made hard but rather smoothed by the authorities at Washington, and that if the various committees concerned have their way manufacturing will be facilitated and there will be profits large enough to be taxed.

England's War Steel Output

The war steel output of the United Kingdom has evidently been increasing of late, and fresh efforts have been set on foot lately to effect a further increase. Our entrance into the war is developing heavy requirements by way of equipment, requirements which when filled need not in many cases be duplicated; but the British experience suggests that after such work is done the vigorous prosecution of war requires great tonnages.

The British Minister of Munitions is urging a plan whereby the production of iron ore in England is to be increased sufficiently to increase the steel output by 3,000,000 tons a year. He expects the first million tons to be added by the end of September and hopes that the whole 3,000,000-ton increase will have occurred within a twelve-month, according to an address he delivered May 15 at Kettering in Northamptonshire. It is from that district and from Cumberland that the greatest additions in the home mining of iron ore are expected. Reference is made to usefulness, for foodstuffs, of the vessel space now devoted to the importation of iron ore, and it may be assumed that in an emergency the increased home production of ore might be used to offset decreased imports; but the main argument is that the production of steel should be increased by 3,000,000 tons. The present rate may be estimated at fully 10,000,000 tons, making 13,000,000 tons in contemplation. The production in 1913, the record up to that time, was 7,663,876 tons, with an increase year by year until 9,244,457 tons was turned out in 1916. In the earlier part of the war there was doubtless considerable consumption of steel for ordinary commercial purposes, while there were fairly large exports to the colonies and to neutral countries. Now the home consumption of steel for purposes not directly connected with the war is probably reduced to practically nothing, while the exports, except of war steel to France, have become quite small. It may be estimated roughly that in 1915 the United Kingdom produced about 5,000,000 tons of steel ingots employed directly and indirectly in the prosecution of war, certainly not as much as 6,000,000 tons, while now there is contemplated a production for that purpose of more than 10,000,000 tons, or twice as much.

British iron and steel exports in April, it may be noted, were 180,869 tons, the smallest for any month since the war started, with the exception of last December. Deducting from the April total the pig iron, wrought iron, castings, etc., there is left only about 118,000 tons, of unfinished and finished steel products. For the past two months the Board of Trade, for prudential reasons, has omitted any reference to the country of destination in the export returns, but it may be assumed that the bulk of the exports went to the Allies, for strictly war purposes, and that was not the case in 1915, when exports of steel and steel products averaged 200,000 tons a month, only about a third being of war material to the Allies.

England, then, is using a great deal more steel for keeping up the war, in intensified form, than in the early stages when much of the work was preparatory. We may pass through the same experience. We are now about to equip camps for an army of half a million men in training, and we are to build a great many aeroplane hangars, with other work of more or less similar character, but later, with all that work largely completed, we may be using a great deal more steel. A large part of the steel England is now using is for railroad equipment, and a still larger tonnage is going into ships. In the address already referred to, the British Minister of Munitions spoke as if the production of the additional steel contemplated would permit the building of ships at a more rapid rate, and that would indicate that the capacity of British shipyards has been increased, or is about to be increased, very considerably.

Manganese and Substitutes

The alloy committee of the Council of National Defense, in its recent canvass of the situation, has learned that the present consumption of ferromanganese in the United States is about 1000 tons per day, or 26,000 to 27,000 tons per month. An analysis of the situation on another page of this issue shows that the country's present available supply is not far from this amount, and the entire situation seems less tense. With a present domestic output of 20,000 tons per month, and an import rate now of 6200 tons per month, any possible decrease in the latter is likely to be made up by an increase in production, plans for which are maturing. It would seem that even with a steel output of 45,000,000 tons this year, enough alloy is assured, especial-

ly when it is considered that the use as well as the supply of spiegeleisen is constantly increasing. The output of the latter has grown much faster than the production of Bessemer steel, indicating its wider use as a partial substitute for ferromanganese.

It is not an agreeable commentary on our resources, however, that our greatest industry depends on foreign sources almost entirely for the ores with which to produce ferromanganese. Out of a total available supply of over 609,000 tons of manganese ore last year, only 33,000 tons came from the United States, while 82 per cent of the imports came from Brazil alone.

Secretary Lane, being asked recently what would happen if our manganese ore imports were shut off, said:

> After our reserve supplies were exhausted we should have to find a substitute, and there is no question about our being able to do so. The substitute would at first cost more than imported manganese, but we would have the steel.

Many steel makers and metallurgists have had less confidence on this subject for some time than Secretary Lane seems to have. What Germany, whose position as to supplies was analogous to ours before the war, is doing on this problem is a matter of mystery and of much speculation. It is not now believed that calcium compounds have filled the need there and reports of wonderful substitutes are not given much credence. Unless steel is being made abnormally low in manganese and inferior in quality, it is not unlikely that some way has been found to use the large deposits in Germany of manganiferous iron ores.

Aside from the limited field of spielegeisen as a substitute for ferromanganese, the reliance of this country might be upon a way to use its large manganiferous iron ores, were such a contingency to arise as the failure of foreign high grade ores. It is regarded possible so to heat these low grade ores as to convert the oxides of iron into magnetic oxides, separate these from the manganese oxides by magnetic separation and thus obtain as tailings a manganese ore averaging as high as 40 per cent manganese. From this ferromanganese of good quality and in large amounts could be produced.

Evidence is increasing that industrial plants are taking orders on a cost and percentage basis. The condition is naturally an outgrowth of the difficulty of getting factories to accept business. While it may be possible to approximate closely the cost of materials entering into a given contract, labor costs are uncertain as well as general expenses in this war period. Some of the buyers express satisfaction over the arrangement and a confidence that they will get entirely satisfactory service, more so than if the business were placed on the old-time method of a fixed sum calculated to include also a reasonable profit.

What radical changes are developing in the relations of Government to business are well illustrated in the negotiations between Washington and the car builders looking to the manufacture of perhaps 100,000 railroad cars. The plan so far seems to call for standardization of design and requisitioning of materials and supplies to expedite manufacture and then to rent the cars to the railroads on a per diem basis. If the steel and lumber are purchased by the Government, car builders should get material and supplies as needed. Disturbance of their regular manufacturing schedules would probably not curtail present output over one-half, particularly if labor is mobilized also for this purpose. Incidentally, car builders would expect to find the orders distributed according to capacity and at a sum bearing some definite percentage relation to the costs of material and labor. It should be said, however, that with all the current discussion of Government orders for cars there is still more than a possibility of the steel being arranged for between the steel manufacturers and the car builders.

CORRESPONDENCE

The Fundamentals of Organized Labor

To the Editor: The perusal of an extract from a letter of the late Frederick W. Taylor, published in a recent issue of THE IRON AGE, brings to mind the great underlying principle, or rather lack of principle, of the workman's attitude. As an individual or as a labor unionist he has no interest in a proposition which involves more productivity for more pay. His belief is that he is entitled to more pay for the amount of work now turned out by him and it is for this that he fights. Encouraged by agitators in the belief that there is ample profit on present production, his sole attempt is to get a larger slice of it. He cares not for or knows nothing of the fact that diminishing profit discourages investment and totally fails to recognize that with no inducements offered to capital there would be no employment for his skill.

As the individual sits at the head of his table and watches his family grow, he realizes the necessity of producing more in order to take care of them. He must produce more money. Yet he cannot grasp the analogy that, as the nation grows, more must be produced to take care of it. He insists upon the more to provide for his own family, but refuses to contribute his share of the more to provide for the national family.

Herein lies the great difference between organized capital and organized labor. Capital encourages, constructs and develops. Organized labor discourages, obstructs and restricts. Capital encourages labor to seek employment, builds up large industries with correspondingly large output, and expands the opportunities for labor by offering bonuses, profit sharing, etc. Unionism discourages membership in trades, fearing its own competition, seeks to obstruct the expansion of capital by limiting its profits and restricts output by demanding a uniform rate of pay irrespective of individual ability. Organized capital is based upon a principle which results in benefit to the people at large because its fundamental is development. Organized labor is based on a principle detrimental to the people at large because its fundamental is restriction. Two fundamentals so widely at variance can never be reconciled. Obligation to the nation as a whole is the lesson which capital has learned, but labor has not.

H. M.

The Henry & Wright Mfg. Company, Hartford, Conn., maker of automatic drill presses, has made a contract to provide $1,000 life insurance on the group plan for each of its employees. More than 100 men will take part in the plan at the outset, and more will be included when they have completed three months' service with the company.

The National Gas Engine Association has voted to affiliate with the Society of Automotive Engineers in engineering matters, having particularly the object of speeding up the general standardization movement.

CAR SUPPLY FOR COKE

Committees Working to Avoid Discrimination in Favor of Iron Ore

Serious consideration is being given the matter of coke supply for blast furnaces by the various committees serving under the Council of National Defense. The Committee on Coal Production, F. S. Peabody, Chicago, chairman, has created a sub-committee on Coke for Blast Furnaces, the chairman of which is E. L. Pierce, president of the Solvay Process Company. Associated with Mr. Pierce are representatives of retort and beehive coke producers.

Conferences have been called within the last week at Washington by the Commission on Car Service with Mr. Pierce's committee, C. D. Dyer of the Shenango Furnace Company, representing the Committee on Iron Ore, Pig Iron and Lake Transportation, and C. L. Doyle, traffic commission of the American Pig Iron Association, in the effort to determine just what is the shortage of pig iron occasioned by the shortage of Connellsville coke. It appeared in all the discussions that while the stocks of coal are shorter than usual at the by-product plants, they are running about to their normal capacity, and that about all the relief that can be furnished from this source to the blast furnaces must come from some help given to the beehive districts.

In the priority of shipment given to Lake ore and coal, a good deal of the coke equipment was forced into the Lake traffic, which rather aggravated the existing shortage of beehive coke. It is in order to extend the guardianship over the pig-iron production that these efforts are being made to have the available open-top cars used for the transportation of all the different commodities necessary to the manufacture of pig iron, so that the preference in car supply will cover the full industry, thus avoiding the discrimination in favor of ore which has inadvertently been brought about.

Attention is being paid also to the matter of limestone along the same lines, and much study is being devoted to these subjects in the preparation of reports and recommendations which will be placed in the hands of the Commission on Car Service within the next few days.

Federal Export Corporation Secures Sligo Rolling Mills

Two interesting developments are to be noted in connection with the Federal Export Corporation, 115 Broadway, New York City. One of these is the organization of a subsidiary known as the Commercial Iron & Steel Corporation, Inc., to concentrate particularly on the buying of materials to be sold by the Federal Company, but incidentally to do some domestic selling, and the other is the acquiring of the plant of the Sligo Steel Company, formerly the Sligo Iron & Steel Company, Connellsville, Pa.

The Sligo plant has a 24-in. plate mill with 66-in. roughing and 60-in. finishing stands, and it is expected that it will be ready to produce plates in August. It has a 9-in. guide mill and a 16-in. bar mill and puddling and heating furnaces, so that rolled iron as well as steel may be produced.

Of the new buying organization, S. C. Munoz is president; Harry Raymond, who retired from the banking house of Raymond, Pynchon & Co., New York, is first vice-president; George Pynchon is second vice-president, and D. S. Guthrie, formerly of the Republic Iron & Steel Company, who joined the Federal Company some time ago, is third vice-president and general manager. Offices have been established in Pittsburgh and Philadelphia, the former through Ward, Darley, Lupold Company, selling agent, First National Bank Building.

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Burden Furnace Leased

Negotiations have been closed by Frank B. Baird, president of the Buffalo Union Furnace Company, and associates for the lease of the Burden Iron Company's blast furnace at Troy, N. Y. The furnace was last active in 1907. It is 80 x 17 ft. and has a capacity of 250 tons a day. After relining it will blow in about Aug. 15.

SHIPBUILDING ACTIVITIES

Definite Details Becoming Known of Government Contracts—Many New Projects Being Organized

Additional contracts for merchant vessels have been announced by General George W. Goethals, general manager of the Emergency Fleet Corporation, as follows:

Sanderson & Porter, New York, with yard at Willets Harbor: Ten wooden hulls, the first to be delivered April 1, 1918, and one hull every fifteen days thereafter, ending Aug. 30, 1918.

Maryland Shipbuilding Company, Baltimore, with yard at Sollars Point, Md.: Six wooden hulls, one to be delivered April 30, 1918, and one hull each succeeding month, ending Sept. 30, 1918.

The summary to date is as follows: Total number of ships and hulls contracted for, 104; total number of contracts executed, 12; complete steel ships contracted for, 18; complete composite ships contracted for, 32; complete wooden ships, 30; wooden hulls contracted for, 104; total complete ships contracted for, 80.

About May 20, a contract was given to the Terry Shipbuilding Corporation, New York, for 20 3500-ton composite ships which it was expected would be built at Moss Point, Miss. Since that time, a new site has been purchased on the Savannah River, five miles above Savannah, Ga., from the Point Wentworth Terminal Company. At this point are to be erected the new steel works in which William Morris Imbrie & Co., New York bankers, are interested, and which will be operated in close co-operation with the Terry Shipbuilding Corporation. The site contains over 100 acres and has a large frontage on the river. Capacious docks will be constructed and buildings for both the steel plant and the shipbuilding plant will be pushed to quick completion. The Terry Shipbuilding Corporation is allied with the Terry & Tench Company, New York, and its officers are Edward F. Terry, president; Frederick Tench, George O. Wagner and H. F. John, vice presidents; Henry L. Brittain, treasurer; and Semp Russ, secretary. Frederick Tench and James Imbrie, accompanied by Charles W. Leavitt, a landscape engineer, have just returned from an inspection of the site and the location of an industrial town has been selected by them. The construction of a complete town with amusement and recreation centers will be necessary to house the thousands of workmen that will be gathered to man the two plants under way. The yard is to be permanent and as soon as the Government work is completed the company will take private contracts and will build and operate ships for itself. The present contract calls for the completion of the 20 ships in 18 months, the delivery of the first ship being set for Feb. 1, 1918.

Acquires Chester Plant

Interests which are represented by Carl W. Hamilton and W. M. Simpson, who have offices at 50 Broad Street, New York, have acquired the Chester Shipbuilding Company, Chester, Pa., and the concern is expected to participate in the building of America's merchant fleet of steel ships. Mr. Hamilton has been elected president and Mr. Simpson treasurer of the company. A few weeks ago at receiver's sale the present owners of the Chester Shipbuilding Company purchased the plant and equipment of the Standard Cast Iron Pipe Company at Bristol, Pa., which with added equipment will provide facilities for building engines and boilers and making steel plates for ships of the composite type. Other property adjacent to the Chester plant, including the plant of the Duplex Metals Company, has been purchased to carry out the plans of the Chester Shipbuilding Company for extensive ship construction. There are at present seven ways at the Chester plant. Nine ships are under construction, these being tankers and cargo boats of about 9000 tons capacity. New equipment is being purchased for the plants at Chester and Bristol. C. P. M. Jack, formerly president of the company, will remain in charge of operations as general manager of the plants.

Newark Bay Site

The Submarine Boat Corporation, with offices at 11 Pine Street, New York, is reported to be the concern which has leased about 112 acres of land on Newark Bay for the construction of steel ocean-going vessels. Officers of the company declined either to confirm or deny the report. The Submarine Boat Corporation, which was formerly the Elco Boat Company, filled an order at Bayonne and Montreal for 550 submarine chasers at the beginning of the war and has built submarines in New England. Another report is that the Submarine Boat Corporation will make submarine chasers at the Newark Bay yard, but this could not be confirmed.

Pacific Coast Activity

Frequent reports continue to come from the Pacific Coast of new shipyards being organized for the building of wooden ships. One Seattle yard, the Washington Shipping Corporation, has taken a contract to build for the French Government six 2600-ton wooden hull ships, to be equipped with semi-Diesel engines. The French Government will also take over three vessels now under construction at the company's Harbor Island yard.

A committee of the Vancouver, B. C., Board of Trade has visited Toronto and asked the Government for assistance in starting a $5,000,000 or $10,000,000 steel shipbuilding industry, as it will form a permanent industry in place of the present temporary wooden ship industry. The Imperial Munitions Board of Victoria, B. C., announces that it has let contracts for 24 wooden vessels. The Foundation Company, Ltd., has been authorized by the Munitions Board to construct a shipbuilding plant at Victoria, B. C., and has received contracts for several wooden vessels.

British Steel Exports Less in April and Imports Larger

British steel exports in April were the lowest for any month this year. Excluding ore and including scrap, they were 180,869 gross tons as compared with 239,965 tons in March, 186,308 tons in February, and 210,124 tons in January. The total to May 1, 1917, has been 817,268 tons, against 1,176,981 tons to May 1, 1916. This difference of over 350,000 tons is due probably more to voluntary restrictions than to submarine warfare.

Pig-iron exports in April were 51,041 tons, against 69,892 tons in March this year, and about 71,000 in April, 1916. Ferroalloy exports, mostly ferromanganese, were 6697 tons as compared with 10,802 tons in March this year, and 11,488 tons in April, 1916.

Rail exports in April were less than one-fifth what they were in April, 1916, or only 2659 tons. Exports of steel bars were 27,840 tons, but the present rate is not as large as a year ago. The total to May 1, 1917, has been 131,432 tons, against 221,973 tons to May 1, 1916.

Imports of steel in April, excluding iron ore and including scrap, were 38,980 tons, comparing with 25,990 tons in March, 27,428 tons in February, and 42,974 tons in January. The April imports are therefore the second largest this year, showing a lessening in that month of the effect of submarines. Iron-ore imports in April were 515,653 tons, against 494,188 tons in March. The total to May 1, 1917, of 2,006,872 tons is only a little short of the total of 2,033,283 tons to May 1, 1916, also a good showing despite submarines.

The Savage Arms Corporation, Sharon, Pa., which took over the Driggs-Seabury Ordnance Company, has discontinued the manufacture of motor trucks. The various forged, pressed and machined steel parts will still be manufactured to supply the trade with spares and the capacity of the plant has been increased to take care of additional business in these lines.

TRANSIT FOR MACHINERY

Reduction of Passenger Service Would Aid Manufacturers Greatly

Judging from some experiences of manufacturers of machine tools, there will be little opposition in that trade to the proposed considerable curtailment of passenger traffic on the railroads. Quite recently one such manufacturer in the Central West had a shipment of parts essential to his machines delayed for weeks. Meanwhile he could not complete the tools, and his experience is a common story. It required six weeks to obtain definite information by which the shipment could be located. The conclusion of this particular shipper is thus expressed:

"The thing which impressed me was that while my individual complaint has been attended to, this was done by obtaining special attention on the part of the railroad men. In other words, the shipment was given undue preference in order to push it through. The final results of such special efforts on the part of a great number of shippers would be to put transportation in a hopeless tangle."

This shipper further pointed out that while freight was held up on every side, the railroads were paying every attention to passenger traffic, and his own observation was that a large part of this traffic was unnecessary and should be eliminated. His views of the remedies which might be applied closely follow those which the American Railway Association's Committee on National Defense in its bulletin No. 5, under date of May 24, advised the railroads of the country to adopt. Chief among the steps which the committee advised was that trains not well patronized should be dispensed with, that the number of special trains should be reduced, excursion trains eliminated so far as possible, and that in some cases mixed trains for passengers and freight be provided. It also was suggested that observation cars be reduced in number, if not altogether discontinued, and dining car service restricted. Since the issuance of the bulletin it is announced that one Eastern road will discontinue its dining car service.

With every one of these recommendations the Middle Western shipper concurs, and he also suggests that a special freight dispatch service might be substituted for some of the passenger trains, supplementing the present express. On this he says:

"Due to the attempt of shippers to get important freight shipments through by express, regardless of expense, the express conditions are almost as bad as those prevailing in freight, although I am not prepared to say that the installation of a freight dispatch service might not unfavorably affect the present system. The entire matter is particularly urgent at this time, as the task of handling the harvest will soon be upon the railroads, and every effort is being exerted to make that harvest large.

"On a recent trip I made, the train was from 15 to 20 minutes late at various points. We had on two or three Pullmans and a diner, and the time we were behind could easily have been made up had this Pullman service been cut down. Freight trains which were passed all along the way would have been released from the sidings, relieving the situation that much."

The views of this manufacturer should be reassuring to the special railroad committee for the reason that the committee has stated that "from time to time it must recommend the adoption of policies which will curtail conveniences the public has enjoyed," and that it "relies upon the support of public opinion in the present national emergency, and feels that this sacrifice . . . will be ungrudgingly granted."

The Carpenter Steel Company, Reading, Pa., employing about 1800 men, announces that the subscriptions of its employees to the Liberty loan amount to $56,000. The company's subscription itself will be $220,000.

EXPANSION IN SOUTHERN FIELD

Steel Corporation Will Make Important Additions to Tennessee Plant

BIRMINGHAM, ALA., June 11.—Chairman E. H. Gary of the United States Steel Corporation issued a formal statement in Birmingham last Saturday in which he said:

"The finance committee of the United States Steel Corporation, after full consideration, has decided to recommend to the Tennessee Coal, Iron and Railroad Company that it proceed promptly and vigorously with the erection of additional works at Fairfield, which are intended to furnish in normal times products for the markets naturally supplied from the Birmingham district, and in particular demand at present on account of the necessities of the Government resulting from war conditions.

"The plans in detail have not been completed by Mr. Crawford, president, and his associates, but it is estimated that the cost of making these improvements will approximate $11,000,000."

Judge Gary's announcement followed a visit to the Birmingham district by the finance committee of the Steel Corporation, who are, besides Judge Gary, Henry C. Frick, George F. Baker, George W. Perkins and Percival Roberts, Jr.

George G. Crawford, president of the Tennessee Coal, Iron & Railroad Company, gave a dinner in honor of the finance committee last Friday evening at the Birmingham Country Club, where Judge Gary and Mr. Perkins were the principal speakers. John Reis, vice president of the Steel Corporation, was also one of the guests.

In his address at the dinner Judge Gary said that since the Steel Corporation became interested in Alabama, it had appropriated about $32,000,000 for the Birmingham territory.

"We regard it as an act of patriotism, an act of loyalty to our country to make these investments at a time when they will be of particular service to the nation," he said.

Judge Gary referred to the dissolution suit of the Government against the United States Steel Corporation, and said that this suit had stopped development in the Birmingham district since 1911. "A Government official came to me," said Mr. Gary, "and said it was possible to have the suit dropped if we would dispose of the Tennessee company. I had been to Alabama and I knew how the people of Birmingham felt toward us—that they had been our friends, our true friends. I told him to go to Birmingham and talk to the people of this city and that if they told him they were willing to have the Steel Corporation dispose of the Tennessee company, to come back and I would talk to him."

No details of the plans of expansion were announced by Judge Gary, who said that such details would be given out later by President Crawford of the Tennessee company.

The entire membership of the finance committee of the Steel Corporation was in Birmingham, with the exception of J. P. Morgan and President James A. Farrell. Mr. Farrell intended to go, but was unexpectedly called to Washington.

An agreement has been reached by the Orbon Stove & Range Company, Belleville, Ill., and the representatives of the Stove Mounters' and Steel Range Workers' Union and the Foundry Employees' Union, and the members of the unions have returned to work after a strike of a few weeks' duration. During the strike, the company obtained an injunction restraining the men from certain acts, and because this injunction was not dissolved, the union officials, June 4, again called the men out. They claimed it was specifically understood that the men should not work with the injunction hanging over them.

The Valley Mold & Iron Corp., Sharpsville, Pa., has taken $250,000 worth of Liberty bonds.

Iron and Steel Markets

PIG-IRON PRICES SOARING

Scramble for Raw Materials Continues

Government's New Steel Purchases at Higher Prices—Plans for 100,000 Cars

The scramble for steel-making pig iron and for melting steel scrap has gone on for another week, with no abatement of the excited conditions. Bessemer pig iron has advanced to $55 on small sales and its further ascent presents no difficulties. Basic iron on sales of more than 50,000 tons at $50 at Valley furnace, has been lifted $5 a ton, while forge iron is $3 higher and foundry iron $5 higher in Pittsburgh and Cleveland markets. Melting scrap has sold at $42.50 in the Pittsburgh district, representing $12.50 advance in two weeks.

This remarkable effort to get hold of raw materials without regard to price, coming when the finished steel market is under check awaiting Government awards, has put the entire trade much at sea as to future steel supply for general consumption and the lengths to which prices will go.

Meanwhile as Government and Allies' demands upon the industry are taking clearer shape, estimates range from 25 to 40 per cent of the country's steel output. The Government's most serious problem now is how to give its Allies all the steel they ask for without crippling domestic industries which last year got all the steel they needed in competition with foreign buyers by paying the price.

In the shipbuilding program rapid strides have been made in the past week and the project for a yard in the New York district for which large steel interests will carry on fabrication on an unprecedented scale is rapidly taking shape under the lead of the Submarine Boat Company. If all plans are carried out as now indicated the Government's plate demands will soon be more than can be met except by curtailing operations of other plate buyers.

The War and Navy departments continue to give out large orders. The shell contracts will total 9,000,000, half shrapnel and half high explosive, taking 80,000 tons of steel. The 34,000 escort wagons placed last week with 15 Central Western wagon makers will require 10,000 tons of finished steel. For each of the cantonments 12,000 kegs of wire nails are wanted—a total of 9600 tons. The rivet inquiry for vessel work amounts to 40,000 tons.

An important development in the Government dealings with steel manufacturers is that the plates, shapes and bars originally arranged for on the 2.90c. and 2.50c. basis have all been allotted to the trade. The recent rapid advances in pig iron and scrap have accented every argument for higher prices on the new awards. From Washington it has been intimated that 4.75c. for plates and 4.25c. for shapes would be acceptable to the Government's representatives.

The Steel Corporation's reduction of 297,000 tons in unfilled orders in May reflects steady refusal of new business and the working off of a large tonnage of obligations preparatory to taking on the Government's contracts. The same policy is being followed by steel manufacturers in all lines.

Negotiations are still in progress between the Government and car companies for the building of 100,000 cars which will be rented to the railroads on a per diem basis. It is entirely probable, however, that equal expedition would be had in the handling of this business, if the steel manufacturers and car builders negotiated directly.

Fresh inquiry from J. P. Morgan & Co. for France includes 25,000 tons of plates and shapes for ship repair, the remnant of what was asked for recently. On domestic ship plate inquiry 11c. and higher has been quoted. In the East a 5000-ton boiler-plate contract has been closed for the third quarter at 10c., and a 7000-ton pending transaction is on the same basis.

The demand for both black and blue annealed sheets from automobile works and other sources has reached large proportions. While it is mainly for the last half of the year, a number of makers are trying to buy round lots for next year.

Coke prices are higher in sympathy with the movement in pig iron and scrap. A contract has been closed for 18,000 tons a month in the last half of the year at $9.50 per net ton at oven.

Coke transport, as the key to the whole scheme of production, has had serious attention in the past week from the special committee appointed at Washington. The forcing of coke equipment into the ore trade has aggravated the car shortage at beehive ovens. Steps are now being taken in connection with Lake ore interests to have all blast furnace raw materials included in the plans for the special handling of open-top cars.

Pittsburgh

PITTSBURGH, PA., June 12, 1917.

It has been another wild week in the pig iron and semi-finished steel trades and the end is not yet. In the past week, Bessemer has scored another advance of $5 per ton, basic $5, gray forge about $3, No. 2 foundry about $5, and malleable Bessemer about the same. Stocks of all kinds of pig iron held by furnaces and in the hands of dealers are rapidly being cleaned up and some in the trade insist that Bessemer and basic iron will go to $75 per ton, or more, before the present movement has ended. It is pointed out that there is still an abnormal differential between prices ruling on Bessemer and basic iron and those on Bessemer and basic billets and sheet bars. Taking the present price of Bessemer iron to be $55, Valley furnace, soft steel sheet bars have sold at $110 or just double the price of iron, which leaves $55 for conversion. Even with present high cost of making steel, this is entirely out of line, and there seems to be ground for the belief of the pig iron maker that he will sell his Bessemer and basic iron before a great while at

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 13, 1917.	June 6, 1917.	May 16, 1917.	June 14, 1916.
No. 2 X, Philadelphia...	**$46.75**	$45.50	$43.50	$20.00
No. 2, Valley furnace...	**50.00**	45.00	42.00	18.00
No. 2 Southern, Cin'ti..	42.90	42.90	42.90	17.40
No. 2, Birmingham, Ala.	40.00	40.00	40.00	14.50
No. 2, furnace, Chicago*.	**50.00**	47.00	44.00	19.00
Basic, del'd, eastern Pa.	42.50	42.50	38.00	19.75
Basic, Valley furnace....	**50.00**	45.00	42.00	18.00
Bessemer, Pittsburgh....	**55.95**	50.95	44.95	21.95
Malleable Bess., Ch'go*..	**50.00**	47.00	44.00	19.50
Gray forge, Pittsburgh..	**47.95**	43.95	40.95	18.70
L. S. charcoal, Chicago..	**52.00**	50.00	46.75	19.75

Rails, Billets, etc., Per Gross Ton..				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh.	**100.00**	95.00	85.00	45.00
O.-h. billets, Pittsburgh.	**100.00**	95.00	85.00	40.00
O.-h. sheet bars, P'gh...	**105.00**	100.00	85.00	40.00
Forging billets, base, P'gh	**125.00**	115.00	105.00	69.00
O.-h. billets, Phila.....	95.00	95.00	75.00	50.00
Wire rods, Pittsburgh...	**95.00**	90.00	85.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.659	4.659	4.159	2.659
Iron bars, Pittsburgh...	4.25	4.25	4.00	2.60
Iron bars, Chicago.. ..	4.00	4.00	3.50	2.35
Steel bars, Pittsburgh...	4.25	4.25	4.00	2.75
Steel bars, New York....	**4.419**	4.169	4.169	2.919
Tank plates, Pittsburgh..	**8.00**	7.00	6.50	3.75
Tank plates, New York..	**8.669**	8.169	6.919	3.919
Beams, etc., Pittsburgh..	**4.25**	4.00	4.00	2.50
Beams, etc., New York..	4.419	4.419	4.419	2.669
Skelp, grooved steel, P'gh	4.00	4.00	3.50	2.35
Skelp, sheared steel, P'gh	6.00	6.00	5.50	2.45
Steel hoops, Pittsburgh..	**5.25**	4.75	4.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	June 13, 1917. Cents.	June 6, 1917. Cents.	May 16, 1917. Cents.	June 14, 1916. Cents.
Sheets, black, No. 28, P'gh	**8.00**	7.50	7.00	2.90
Sheets, galv., No. 28, P'gh	**9.50**	9.00	8.00	4.75
Wire nails, Pittsburgh..	3.50	3.50	3.50	2.50
Cut nails, Pittsburgh....	4.00	4.00	3.75	2.60
Fence wire, base, P'gh..	3.45	3.45	3.45	2.45
Barb wire, galv., P'gh..	4.35	4.35	4.35	3.35

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	**$43.50**	$40.50	$32.50	$18.00
Iron rails, Philadelphia.	**45.00**	38.00	34.00	20.00
Carwheels, Chicago.....	**36.00**	34.00	25.50	12.75
Carwheels, Philadelphia.	**35.00**	31.00	27.00	16.50
Heavy steel scrap, P'gh..	**42.00**	35.00	29.00	16.00
Heavy steel scrap, Phila.	**32.50**	28.00	25.00	15.50
Heavy steel scrap, Ch'go.	**35.00**	33.00	28.50	14.75
No. 1 cast, Pittsburgh....	**35.00**	30.00	26.00	16.00
No. 1 cast, Philadelphia.	**32.00**	31.00	29.00	16.50
No. 1 cast, Ch'go (net ton)	**30.00**	27.00	22.00	11.75
No. 1 RR. wrot, Phila...	**50.00**	44.00	41.00	20.50
No. 1 RR. wrot, Ch'go (net)	**40.00**	37.00	31.00	15.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	**$11.00**	$10.00	$8.00	$2.40
Furnace coke, future....	**9.50**	9.00	7.50	2.50
Foundry coke, prompt...	**12.00**	10.50	9.00	3.25
Foundry coke, future....	10.00	10.00	9.00	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	32.50	32.50	31.50	28.00
Electrolytic copper, N. Y.	32.50	32.50	31.50	27.75
Spelter, St. Louis.....	9.50	9.50	9.12½	13.25
Spelter, New York.....	9.75	9.75	9.37½	13.50
Lead, St. Louis.....	**11.87½**	11.50	10.37½	6.70
Lead, New York.....	**12.00**	11.50	10.50	6.85
Tin, New York.....	**60.62½**	60.25	65.75	43.25
Antimony (Asiatic), N. Y.	*20.00*	21.50	26.00	20.00
Tin plate, 100-lb. box, P'gh	**$10.50**	$8.50	$8.50	$5.75

close to, or at all of, $75 at his furnace. It is very evident that raw and semi-finished materials, such as coke, scrap, pig iron, and semi-finished steel are getting in the same condition as regards prices and supply that have ruled for so long on finished lines of steel, such as plates and shapes, steel bars, sheets and tin plate, tubular goods and other kinds of finished products. Where the present movement will stop, no one knows, but much higher prices on the raw materials noted above seem absolutely certain.

The domestic demand for finished steel has quieted down to some extent, this largely for two reasons: first, the consuming trade is pretty well covered over the remainder of this year, while those consumers who have not fully covered are in a quandary as to whether to buy or not. The mills can hold out little promise of delivery on steel during this year, and buyers are afraid to contract into next year at present prices. The mills are not anxious to sell much more material than they now have on their books, feeling that the Government may soon come along and take from 25 to 40 per cent of their output or more. Once it is known even fairly definitely how much steel the Government will want over the next year or two, the present clouded situation will clear up to some extent. As it is now, steel producers and consumers are up in the air and do not know what to do. In the meantime, prices are going steadily higher on practically everything embraced in raw materials, semi-finished and finished steel. The car situation is still bad, with no relief in sight. How the crops are going to be moved is a great problem. The Government will probably buy large quantities of cars, but it will be some time before the car companies could make deliveries, and in the meantime, material is piling up steadily, awaiting cars for shipment. The labor situation is giving steel manufacturers, and all other lines of business as well, grave concern. When employees commence to join the army, there will not be available men to replace them, and it is probable that in many manufacturing plants female labor will be employed to help out. The railroads are very short of labor, and are now taking on women for certain kinds of work that heretofore has always been performed by men.

Pig Iron.—The past week has been a sensational one in the local pig iron market. Bessemer iron on only a few small sales has advanced squarely to $55, basic to $50, and all other grades in proportion. One local steel interest has bought within a week 25,000 tons of basic iron for this year's delivery, for which it paid $50 at Valley furnace. Another sale of 10,000 tons of basic has been made at the same price. So far, little Bessemer iron has been sold at $55, but that is the absolute minimum on Bessemer at this writing, and it is freely predicted that it will be $60 or higher within a week or ten days. A firm offer of $50 per ton for 6000 tons of Bessemer iron, deliveries 500 tons a month over all of 1918, has been made, and has been turned down by the furnaces. Fairly large sales of No. 2 foundry iron have been made for delivery over 1918 at $50 per ton at Valley furnace. There have been sales of small lots of No. 2 iron for this year's delivery at $51 to $53 at Valley furnace. We note a sale of 300 tons of No. 2 foundry at $51 Valley furnace and 600 tons of malleable Bessemer for this year's delivery at $50 Valley furnace. We note a sale of 3000 tons of forge iron for last half of this year at $47 Valley furnace. We now quote standard Bessemer iron, $55; malleable Bessemer, $50 to $52; basic, $50; No. 2 foundry, $50 to $53, and gray forge, $47, all at Valley furnace. The freight rate for delivery in the Pittsburgh and Cleveland districts from Valley furnaces is 95c. per ton.

Billets and Sheet Bars.—Prices on semi-finished steel have again advanced from $5 to $10 per ton. A sale of 2000 tons of soft Bessemer sheet bars for third-quarter delivery has been made at $105, and a sale of 3000 tons of open hearth sheet bars is reported at $110 per ton, maker's mill. Soft Bessemer and open hearth billets range from $95 to $100 per ton at maker's mill.

There is a heavy demand for discard steel, which has also advanced in price. A sale of 2500 tons is reported at about $44, seller's mill. Forging billets are also up, and are now quoted at $125 to $130 for ordinary carbons. We now quote soft Bessemer and open hearth billets at $95 to $100, and soft Bessemer and open hearth sheet bars at $105 to $110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 to $135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Structural Material.—Very little new domestic business is being placed, and the steel mills will not actively seek new business in structural steel until they know more definitely what demands will be made on them by the Government. The Blaw Steel Construction Co. has taken about 3000 tons for new steel mill buildings for the Youngstown Sheet & Tube Co., Youngstown, Ohio. The American Bridge Company will probably be awarded the steel for the new structural shop at the Brooklyn Navy Yard, about 3500 tons. The Pennsylvania Railroad has placed 600 to 800 tons of bridge work among independent mills.

We quote beams and channels up to 15 in. at 4.25c. to 4.50c. at mill for fairly prompt delivery. From warehouse prices range from 5c. to 5.50c. and higher, depending upon quantity.

Plates.—Some estimates have put the quantity of plates that will be needed by the Government for its various programs at as high as 40 per cent of the total output of the plate mills, but it is believed this estimate may be too high. It is probable that within a short time several mills will discontinue selling plates, except to manufacturing customers, and even to some of these not more than 25 to 50 per cent of their requirements will be furnished. Reports are that the Government will shortly place contracts for 100,000 cars or more, but no official information on this has yet reached local steel car builders. There will be a very large increase in output of plates by the end of this year, and a very much larger increase by July 1, next year. The new plate mill of the Carnegie Steel Company is expected to be ready about November, while the two new plate mills of the Brier Hill Steel Company and the new 84-in. plate mill of the Youngstown Sheet & Tube Company, contract for which was placed last week, will not likely be ready for operation before a year or 15 months. We continue to quote one quarter inch and heavier sheared plates at 7c. to 8c. at mill for delivery in four to six months, while for shorter delivery 9c. and even 10c. are said to have been done. Ship plates are still quoted 9c. to 12c. at mill. The above prices apply only on domestic orders.

Steel Rails.—Nothing is being done in the way of placing orders for standard sections rails, and the mills do not want them. The new demand for light rails is still very active, but the Carnegie Steel Company is practically out of the market, having its entire output sold up for this year and all of 1918.

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. We quote light rails as follows: 25 to 45 lb., $60; 16 to 20 lb., $61; 12 and 14 lb., $62; 8 and 10 lb., $63; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard section rails of Bessemer stock are held at $38, and open-hearth $40, per gross ton, Pittsburgh.

Tin Plate.—The department of commerce has asked the American Iron and Steel Institute to name a committee to allot pig tin to consumers in this country. It is said assurances have been given by England that its shipments will be governed by any conditions named by this committee. It is said that all shipments of tin plate to concerns making non-perishable foods have practically been cut off, and that these concerns must use other containers than tin for their products. Assurances now seem to be fairly good that there will be enough tin plate by Aug. 1 to make containers for perishable foods, even with the enormous demand that is expected. This has been brought about by the eagerness with which the tin plate mills have co-operated with the Government in conserving their output of tinplate for packers of fruit, vegetables, meats and other perishable foods. The export demand for tin plate is still very heavy. One inquiry has come in from Italy for 100,000 boxes and a similar inquiry from the Orient. There is no doubt that $15 or more would be paid for tinplate on these inquiries if it could be had, but it is not likely any American mills will even quote on them. The bulk of the output of tinplate is sold up, and now sales being made are only on small lots from mill warehouse. On such sales, mills are quoting $10 to $10.50 for primes, with the usual differential of 25c. less for wasters. We note, however, a sale of 15,000 boxes of tinplate, and another of 11,000 boxes for delivery in the next three to six months at $15, base, at mill. This plate is to be supplied by a new producer in the Pittsburgh district, who hopes to start making plate about Monday, June 18. The new demand for terne plate is quiet, nearly all mills confining their output to bright plate as far as possible.

We quote long terne plate, No. 28 gage base, at $7.25 to $7.50; short terne plate, $12 to $12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C., $16.50; 25 lb., I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C., $18.75; 40-lb., I. C., $19.50.

Sheets.—The sub-committee on sheet steel, consisting of W. S. Horner, chairman, and who is also president of the National Association of Sheet and Tin Plate Manufacturers, Charles O. Hadley of the Alan Wood Iron & Steel Company, Conshohocken, Pa., and Walter C. Carroll of the American Sheet & Tinplate Company, is meeting in the Oliver Building, this city, to-day, Tuesday. It is expected that within a few days some definite announcement will be made as to how the Government's orders for sheets are to be distributed among the different mills. The supply of all grades on sheets is steadily getting less, and prices are advancing. Four or five of the larger sheet mills are practically out of the market as sellers. Any concerns that desires to place contracts for sheets with the mills, claiming they are to be made up into articles for the Government, are being required to show strong documentary evidence that this is the case.

We quote No. 3 to 8 gage, blue annealed sheets, 7c. to 7.25c.; No. 28 box annealed one pass Bessemer, cold rolled, 7.50c. to 8c.; No. 28 galvanized, 9.50c. to 10c., and No. 28 black plate, tin mill sizes, 7.50c. to 8c., all f.o.b. mill, Pittsburgh. These prices are for carload and larger lots, for delivery over the next 4 to 6 months to the domestic trade. For fairly prompt delivery, premiums are still being paid.

Hoops and Bands.—There is really no market price on either hoops or bands. Mills are practically sold up over the next four to six months, and each order that is received has its own treatment, the price quoted depending on whether the buyer is a regular customer or is seeking a new source of supply. In a general way steel hoops are quoted at 4.50c. to 5c. at mill for forward delivery and steel bands at 4c. for indefinite shipment and 4.50c. to 4.75c. for delivery in three to four months, these prices f.o.b. at mill. Small lots of hoops and bands for fairly prompt shipment have sold at higher prices.

Iron and Steel Bars.—The new demand for iron and steel bars is quieter, and this is taken to mean that consumers are covered for some time ahead. Specifications against contracts from implement makers on steel bars are only fair, but from other consumers are coming in freely. The output of the mills on steel bars is practically sold up for this year, and of course at lower prices than are now being quoted.

We now quote steel bars at 4.25c. to 4.50c. for delivery late this year, and from 4.50c. to 5c. and higher from warehouse, in small lots, for prompt shipment. We quote refined iron bars at 4.25c., and railroad test bars at 4.40c. to 4.50c. in carloads and larger lots f.o.b. mill.

Muck Bar.—The prices on forged pig iron is now $47 to $48 at valley furnace, and this means a material advance in prices on muck bar. It is probable that $80 for all pig iron muck bar could be readily obtained, or even $85 if the mill had the bar to spare.

Wire Products.—The wire market seems to be shaping itself for another advance in prices which may come at an early date. One large maker of wire and wire nails is not quoting, as the company believes wire nails should be $4 base per keg, this price the highest ruling on steel bars and other products, which do not cost as much to make as wire nails. The new demand for wire

and wire nails is fairly heavy, but most consumers are covered for three or four months ahead. The export demand for both nails and wire is active, but local mills say they cannot quote, as they desire to conserve their entire output for the domestic trade.

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $2.55 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.45; galvanized wire, $4.15; galvanized barb wire and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 48 per cent off list for carload lots, 47 per cent off for 1000-rod lots, and 46 per cent off for small lots, f.o.b. Pittsburgh.

Shafting.—The new demand and specifications for shafting from the automobile and implement trades has fallen off very much, but it is believed this condition will readjust itself when the Government commences to place contracts for trucks and other vehicles for war purposes. These will require very large quantities of shafting, and are expected to more than take up the slack that is not filled by reason of the falling off in demand from the automobile and implement makers. The new demand for shafting from the screw stock and machinery trades is heavy, and specifications are active. Deliveries of large rounds and squares range from four to five months, but on smaller sizes are 10 to 12 weeks. Discounts on cold rolled shafting range from list to 10 and 5 per cent off, but in a few cases 15 per cent off list is still being done to a few favored large consumers.

Wire Rods.—The new demand for rods is still greatly in excess of the supply. Canada is a persistent buyer of wire rods, and it is said that recently soft rods for delivery in Canada have been sold at close to $100 at mill. There is also a heavy demand for high carbon rods made from special steels, which bring $110 and higher at maker's mill.

We quote soft Bessemer and open-hearth rods to domestic consumers at $90 to $95; high-carbon rods made from ordinary open-hearth steel, $90 to $100, and special steel rods, with carbons running from 0.75 to 0.90, $105 to $115 at mill.

Railroad Spikes and Track Bolts.—The new demand for spikes is dull, the railroads evidently not caring to contract for delivery over the last of this year on account of their uncertain position as regards transportation demands to be made on them when troops and war supplies start to move. There is now and has been for months a very serious car shortage, and new cars, rails, spikes and other track materials are badly needed by railroads, but for the reason cited above they are not buying. Makers report the new demand for boat spikes abnormally heavy and much beyond their capacity to fill promptly. Prices on both spikes and track bolts are very firm and likely to be higher.

We now quote railroad spikes 9/16 in. and larger at $4.00 to $4.10 base, ⅝ in., 7/16 in. and ½ in., $4.50 to $5.00 base, 5/16 in., $5 to $5.50 base. Boat spikes are about $5 base, all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting above that price. We quote track bolts with square nuts at 6c. to 6.50c. to railroads, and 7c. to 7.50c. in small lots, for fairly prompt shipment.

Ferromanganese.—The new inquiry for ferromanganese is quite heavy. Some fairly large contracts have been closed for delivery over last half of this year and one contract is said to carry delivery up to July 1, next year. Some deliveries are being made on contracts for English 80 per cent ferromanganese, but these are few, the greater part of the business being done in domestic. We quote 80 per cent domestic ferromanganese for fairly prompt shipment at $450 per gross ton at furnace. On contracts for last half of this year, $425 is quoted and for first half of next, $400 at furnace. Prices ranging from $200 to $250 are being paid for small lots of ferrosilicon for prompt delivery. The leading maker of 50 per cent ferrosilicon is still furnishing it to regular customers at $100 per ton on contracts made late last year and early this year. The same interest is said to have made some small sales for fairly prompt delivery at the same price, so that the present range in prices on 50 per cent ferrosilicon is from $100 per gross ton by the leading producer up to $250 per ton, charged by the smaller producer. We quote 18 to 22 per cent spiegeleisen at $80, and 25 to 30 per cent at $100 to $110, delivered. Prices on Bessemer ferrosilicon and silvery iron are very firm, and on the former are $15 higher. We now quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125 and 16 per cent $135. We now quote 7 per cent silvery iron at $51 to $52, 8 per cent $52 to $53, 9 per cent $54 to $55, 10 per cent $55 to $56, 11 and 12 per cent $57 to $58. All f.o.b. at maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Wrought Pipe.—Conditions in the wrought iron steel pipe trade remain the same as noted in this report for some months past. On lap weld iron and steel pipe, mills are practically sold up for all of this year, and have orders on their books for early 1918 delivery. The new demand for oil country goods is enormously heavy, and very high premiums in prices are being paid for fairly prompt delivery. On butt weld iron and steel pipe mills can make delivery in three to four months. Discounts now in effect are given on another page.

Tubes.—There is no market that can be accurately reported on boiler tubes. Makers of both iron and steel tubes are sold up for a year or more ahead, but any mill that can spare any tubes for reasonably prompt delivery can get any price it asks. Discounts, which are purely nominal, but which do not represent actual prices, are given on another page. These are carried in our columns for the reason that the mills have not issued new lists since these went into effect Nov. 1, 1916, on iron tubes and April 2, 1917, on steel tubes.

Cold Rolled Strip Steel.—It is not a question of price in the cold rolled strip steel trade, but where to get the material. On current orders, mills are quoting 8.50c. to 9c., and on contracts for delivery at convenience of the mill, which probably will not be before very late this year, 8c. to 8.50c., at mill. None of the makers of cold rolled strip steel has opened books for third quarter business, but all makers are back in deliveries from four to six months. On cold rolled strip steel contracted for some time ago for delivery in second quarter, shipments will not start before late in third quarter. There is still a scarcity in the supply of steel and labor, and this is cutting down output to a considerable extent. It is said that some orders for cold rolled strip steel have already been placed by the Government, and larger orders are expected later.

We quote on current orders 8.50c. to 9c. at mill for delivery to July 1. For indefinite delivery, which will not be before late in the year, prices are 8c. to 8.50c. at mill. Terms are 30 days net, less 2 per cent for cash in 10 days, delivered in quantities of 300 lb. or more.

Rivets.—An association of makers of rivets, also of nuts and bolts, has recently been organized under the name of the Bolt, Nut and Rivet Institute, details of which are given on another page in this issue. The new demand for rivets is still very heavy, but most large users have contracted for their needs for last half of this year, and specifications are heavy. Foreign inquiry is also active, but not many foreign contracts are being taken, largely because of the heavy domestic demand, and also by reason of the trouble in getting cars and bottoms for export shipment. Prices are very firm, and are as follows:

Structural rivets, $4.75 per 100 lb. base; boiler, $4.85 per 100 lb. base.

From July 1, 1917, to Oct. 1, 1917, structural rivets, $4.90 per 100 lb. base; boiler, $5 per 100 lb. base. F.o.b. Pittsburgh, Pa.

Terms: 30 days net or ½ of 1 per cent for cash in 10 days.

Coke.—Last week the average car supply was 52 per cent, but on Monday, June 11, it was 90 per cent, so that producers and shippers are hopeful that the general average this week will be much higher than last week. There is a fairly heavy demand for blast furnace coke for prompt shipment, especially from eastern blast furnaces, and prompt furnace coke has sold for eastern shipment over Pennsylvania Railroad at as high as $11 per ton. For delivery in the Valley districts,

the price is lower, ranging from $10 to $10.50 per ton. Nothing is being done in contracts for blast furnace coke, and it is probable that some large consumers, whose contracts expire on June 30, will buy from week to week in preference to making contract. In the past week, some large contracts for 72-hour foundry coke have been closed for delivery in the last half of this year at $10 per net ton at oven. These contracts amount to about 75 cars per month, and one contract was closed for 72-hour foundry coke for the year beginning July 1, 1917, at $10.50 per net ton at oven. The fact that $10 and even $10.50 has been paid for foundry coke on contracts will have an influence on prices to be paid for blast furnace coke for last half of this year. None of the producers at present will sell high-grade blast furnace coke for last half of the year delivery at less than $9 per net ton at oven, and some are not anxious to make contracts, even at that unheard-of price. We now quote high-grade blast furnace at $10.50 to $11, per net ton at oven, while on contracts, nothing less than $9 would be considered. Prices on foundry coke are also higher for prompt shipment, and we quote at $11.50 to $12 per net ton at oven. On contracts for last half of this year, high grade foundry coke readily brings $10 per net ton at oven. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending June 2, as 345,720 tons, an increase over the previous week of 1095 tons.

Nuts and Bolts.—Makers continue to report the new demand for nuts and bolts as very heavy, and deliveries of steel by the mills are not any better, so that output of nuts and bolts is cut down materially. The shortage in cars is holding up shipments, and many thousands of kegs of nuts and bolts are stored in warehouses, awaiting cars for shipment. There is not much foreign inquiry, and makers are conserving their entire output to meet demands of domestic trade. Prices are very firm.

Discounts in effect are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 lays:

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq., blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq., blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Old Material.—Again the Carnegie Steel Company has come into the market, and has bought 30,000 to 40,000 tons of selected heavy steel scrap for shipment to the Homestead Steel Works at Munhall, Pa., paying $40 for some of it, and as high as $42.50 for the remainder, delivered. The company is also said to have bought further large quantities of borings and turnings, mostly for shipment to its blast furnaces at Rankin, Pa. As one large dealer puts it, the local scrap market is "sizzling" on account of these purchases, and prices on heavy steel scrap have gone up fully $7 per ton, and on other grades from $2 to $5 per ton. There is a very heavy new demand for low phosphorus melting stock, and prices at this writing are $55 to $65 per ton, delivered. Turnings have sold at $20 and higher, and borings at $21 and higher. Two or three of the larger local scrap dealers who sold to the Carnegie Steel Company very large quantities of heavy steel scrap, most of which they bought from smaller dealers, are now having trouble in getting deliveries on the material. It seems that steel scrap has finally come into its own, and it is believed that heavy steel melting scrap may sell at $50 per ton and higher, and other grades $5 per ton or more higher before the present upward movement is over. Dealers who have sold short are having great trouble in covering their short sales. All grades of scrap are up from $2 to $7 per ton, with chances in favor of still higher prices. Prices now being quoted by dealers for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered	$42.00 to $45.00
No. 1 foundry cast	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	45.00 to 48.00
Hydraulic compressed sheet scrap	32.00 to 33.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	25.00 to 26.00
Bundled sheet stamping scrap	23.00 to 24.00
No. 1 railroad malleable stock	32.00 to 33.00
Railroad grate bars	20.00 to 21.00
Low phosphorus melting stock	55.00 to 57.00
Iron car axles	55.00 to 60.00
Steel car axles	55.00 to 60.00
Locomotive axles, steel	60.00 to 65.00
No. 1 busheling scrap	30.00 to 32.00
Machine-shop turnings	21.00 to 22.00
Old carwheels	35.00 to 37.00
Cast-iron borings	22.00 to 23.00
*Sheet bar crop ends	45.00 to 48.00
No. 1 railroad wrought scrap	43.00 to 45.00
Heavy steel axle turnings	26.00 to 27.00
Heavy breakable cast scrap	28.00 to 30.00

*Shipping point.

The Duquesne Iron & Metal Company has been organized to deal in iron and steel scrap, and has opened offices in the Fulton Building, Pittsburgh. The company has also established a large scrap yard on Beaver Avenue, N. S., Pittsburgh, and equipped it with machinery for cutting up scrap. J. B. Stalnaker is president, and Robert Cargo, formerly with the John Eichleay, Jr., Company, is vice-president.

Chicago

CHICAGO, ILL., June 11, 1917.

The demand on western mills for materials involved in war preparations is steadily assuming larger proportions. Most of it is coming from contractors, the genuineness of whose specifications are usually certified by Government officials or bureaus. Iron and steel for army wagons and motor trucks, sheets for field stoves, plates for tanks; bolts, nuts and rivets for vehicles, even a small order for cast-iron pipe, are involved. The Government's order placed in the West for 34,000 army wagons is directly responsible for no small tonnage of iron and steel. This business, and more of it to follow, must be taken on top of contracts which already have filled the mills, and the big problem is to postpone deliveries in private directions in order that the nation's needs may be promptly cared for, as they must be. The leading interest reasserts that it has nothing to sell, and no prices to quote, outside of its business with the Government, and other mills are nearly in the same position. Special prices are made where materials are to enter war equipment. Whatever tonnage the Government requires, it is not believed that the mills will be overwhelmed. The suggestion that the Government buy cars is favorably regarded, as the importance of movement by rail is equal to that on water. Quotations on malleable Bessemer, No. 2 foundry and basic have been advanced $3. Old material continues to soar in price, with the demand heavy from all directions. The Steel Corporation is still buying.

Pig Iron.—Prices have been advanced to $50 for both last half and first half delivery on Northern No. 2 foundry, malleable Bessemer and basic. No large inquiries are before the trade, but a considerable number of small ones remain to be satisfied. The strength of the market is unquestioned. As has been the case for some weeks, more or less irregularity is shown in Southern iron, concerning the delivery of which complaints are many. From the Birmingham district, in particular, shipments are backward because of the lack of railroad cars. From Tennessee the movement is better, but still not what it should be. For first-half delivery, Southern iron has been purchased at $40, Birmingham, or $44, Chicago. For the last half, sales have been made at $40 to $42.

Birmingham, or $44 to $46, Chicago, but the latter price is now more nearly the market. One important interest will not sell for this year at all except at $46, Chicago, and then only when the sale includes twice the tonnage for 1918 delivery. The dominating fact is that Southern iron is extremely scarce, if wanted this year. Three Jackson, Ohio, furnaces which produce silvery iron are still affected by strikes, and such small lots of their product as are obtainable bring fancy prices. For a small lot of 9 per cent silicon, $75, furnace, was paid. The Tennessee makers of silveries are pretty well sold up for this year, and as a rule are not selling for 1918 delivery. One maker offered some 7 per cent at $49.75, Chicago, first half delivery, which would make 8 per cent about $50.75, Chicago, for the same delivery. For this year, 8 per cent is not less than $54.75, Chicago. A maker of charcoal iron has just established the following prices for all deliveries up to July 1, 1918: Grades 1 to 4, inclusive, $50, furnace; Scotch grades and Nos. 5 and 6, $52.50, f.o.b., furnace. These are minimum prices. They take a freight rate of $2. A few thousand tons of charcoal iron are available for delivery during both last half of 1917 and first half of 1918. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer, and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, Nos. 1 to 4	$52.00
Lake Superior charcoal, Nos. 5 and 6 and Scotch	54.50
Northern coke foundry, No. 1	50.50
Northern coke foundry, No. 2	47.50
Northern coke foundry, No. 3	49.50
Northern high-phosphorus foundry	47.00
Southern coke No. 1 f'dry and 1 soft	$45.50 to 47.00
Southern coke No. 2 f'dry and 2 soft	44.00 to 46.00
Malleable Bessemer	47.00
Basic	47.00
Low-phosphorus	80.00
Silvery, 8 per cent	54.75

Ferroalloys.—Domestic makers of 80 per cent ferromanganese continue to quote $425 to $450 for delivery this year. They are not attempting to sell into 1918. It is expected that a new producer of ferrosilicon will appear in the western field in the near future.

Rails and Track Supplies.—Railroad business in this direction seems to have been confined to a few small lots of track fastenings.

Quotations are as follows: Standard railroad spikes, 4c. to 4.10c. base; small spikes, 4.25c. to 4.35c., base; track bolts with square nuts, 5c. to 5.10c., all in carloads, Chicago; tie plates, $60 to $70 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $60; 16 to 20 lb., $61; 12 lb., $62; 8 lb., $63; angle bars, 3.25c., base.

Plates.—One source of information puts the quotations for tank plates at 8.50c. to 8.75c., Chicago, delivery in four to five months, while another quotes 8.50c. to 10c., Pittsburgh. Practically every maker, including the leading interest, has little or none to sell for the remainder of the year, and is not attempting to do business except where Government needs are involved. A fair-sized tonnage will be furnished for tank work at army encampments. The controversy over the question of building wooden ships is being closely watched with a natural tendency on the part of mill representatives to favor boats of steel. Jobbers have advanced their quotation $20 per ton.

We quote for Chicago delivery of plates out of jobbers' stocks, 5c.

Structural Material.—On reasonably prompt deliveries mills are quoting from 5c. upward, the equivalent of jobbers' prices for material out of warehouse, but only a few makers are quoting at all. The principal producer reasserts that it has none to sell, consequently no price to quote. The minimum of an Eastern maker is 6c., Pittsburgh. It is reported that the Russian Government is still negotiating for 2000 small cars similar to those purchased two weeks ago. The report that the United States Government might place an order for a large number of freight cars is favorably regarded on the ground that it is as important to expedite the movement of freight on land as at sea; also because car builders can secure steel only through Government intervention. Structural lettings have been few and relatively unimportant, as follows:

Armory for Purdue University, Lafayette, Ind., 419 tons, to the Central States Bridge Company.

Additions and alterations to boiler shop M-6 of the Chicago and Northwestern Railway Company, 310 tons, to A. Bolter's Sons Company.

Jobbers quote 5c. for material out of warehouse.

Bars.—In mild steel bars some of the principal makers are out of the market. Quotations range from 4.189c. to 4.689c., Chicago, delivery in three to four months. The minimum for both rail carbon and iron bars is 4c., Chicago. The former are not as active as they were a few weeks ago, presumably because of the higher price. To some extent iron bars are being substituted for steel. The large Government purchase of army wagons will mean the consumption of no small amount of iron.

We quote prices out of store for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Sheets.—No news or information is obtainable from large factors in the sheet trade, beyond the fact that conditions are unchanged. They are out of the market so far as domestic consumers are concerned. On the other hand, Government orders, placed indirectly, are coming to the fore at a lively rate and are being figured on at special prices. One large order involves several thousand army field stoves. In some cases Government officials are confirming these orders by telegraph. No. 28 galvanized range from 9.689c. to 10.689c., Chicago; No. 28 black at 8.189c. to 8.689c., Chicago, and No. 10 blue annealed at 7.939c. to 8.189c., Chicago, although it must be understood that mill prices vary to an even greater extent. Jobbers have advanced all quotations ½c.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 8.50c.; No. 28 black, 8.50c., and No. 28 galvanized, 10.50c.

Rivets and Bolts.—Vehicle makers have placed orders for large quantities of bolts and nuts needed for army wagons at prices specially arranged with the Government. It is understood that negotiations are under way whereby a large bolt and nut manufacturer will undertake some special work for the Government.

Mill quotations are without change, as follows: Carriage bolts up to ⅝ x 6 in., rolled thread, 40; cut thread, 35-2½; larger sizes, 25; machine bolts up to ⅝ x 4 in., rolled thread, with hot-pressed square nuts, 40-10; cut thread, 40; large size, 30; gimlet-point coach screws, 45; hot pressed nuts, square, $2.10 off per 100 lb.; hexagon, $1.50 off. Structural rivets, ¾ to 1¼ in., 4.75c. to 4.939c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 5c.; boiler rivets, 5.10c.; machine bolts up to ⅝ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅝ x 6 in., 40-2½; larger sizes, 30-5; hot-pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Wire Products.—No change can be reported. Practically no new business is being taken except that inspired by the war. The quotations of the leading interest are unchanged. To jobbers it quotes per 100 lb. as follows, other makers quoting on the basis of 3.50c., Pittsburgh, for wire nails:

Plain fence wire, No. 6 to 9, base, $3.339; wire nails, $3.389; painted barb wire, $3.539; galvanized barb wire, $4.239; polished staples, $3.539; galvanized staples, $4.239, all Chicago, carload lots.

Cast-Iron Pipe.—Kansas City, Mo., is expected to place 3100 tons, June 13; Hammond, Ind., 100 tons, June 20, and Piqua, Ohio, 100 tons, to-day. Toledo, Ohio, awarded 400 tons to James B. Clow & Sons, Chicago. The town of Drake, N. D., has awarded 200 tons to the United States Cast Iron Pipe & Foundry Company. Quotations are unchanged at the level established last week.

Quotations per net ton, Chicago, are as follows: Water pipe, 4-in., $61.50; 6 in. and larger, $58.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—The Steel Corporation has not yet

satisfied its requirements for miscellaneous grades of old material, and this tends to support an already rigid market. The scarcity grows, and from appearances there is not enough scrap to go round. Busheling steel is especially scarce, inasmuch as most of it is going into shoveling steel. Several railroads have issued lists, but none is of large proportions. In the aggregate, however, they represent several thousand tons. Among the roads offering are the following: Erie, Minneapolis, St. Paul & Sault Ste. Marie; Chicago, St. Paul, Minneapolis & Omaha; Northern Pacific, Santa Fe, Chicago & Eastern Illinois, Cleveland, Cincinnati, Chicago & St. Louis, and the Pere Marquette. Swift & Co. offer seven cars. We quote for delivery at buyers' works, Chicago, and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$43.50 to $44.50
Relaying rails	42.50 to 43.00
Old carwheels	36.00 to 37.00
Old steel rails, rerolling	45.00 to 45.50
Old steel rails, less than 3 ft.	39.50 to 40.00
Heavy melting steel scrap	35.00 to 37.00
Frogs, switches and guards, cut apart	35.00 to 37.00
Shoveling steel	34.00 to 36.00
Steel axle turnings	24.00 to 25.00

Per Net Ton

Iron angles and splice bars	$42.50 to $43.00
Iron arch bars and transoms	44.50 to 45.00
Steel angle bars	36.50 to 37.00
Iron car axles	49.50 to 50.50
Steel car axles	48.00 to 49.00
No. 1 railroad wrought	40.00 to 41.00
No. 2 railroad wrought	36.50 to 37.00
Cut forge	37.00 to 37.50
Pipes and flues	25.50 to 26.50
No. 1 busheling	29.00 to 30.00
No. 2 busheling	23.00 to 24.00
Steel knuckles and couplers	38.00 to 39.00
Steel springs	39.50 to 40.00
No. 1 boilers, cut to sheets and rings	24.50 to 25.00
Boiler punchings	33.50 to 34.00
Locomotive tires, smooth	40.00 to 40.50
Machine-shop turnings	16.00 to 17.00
Cast borings	16.00 to 17.00
No. 1 cast scrap	30.00 to 31.00
Stove plate and light cast scrap	21.50 to 22.50
Grate bars	24.50 to 25.00
Brake shoes	24.50 to 25.00
Railroad malleable	30.50 to 31.00
Agricultural malleable	27.00 to 28.00

Philadelphia

PHILADELPHIA, PA., June 11, 1917.

Pig Iron.—The market is strong and the trend of prices is upward. The chief feature of the week's trading was the placing of the Baldwin Locomotive Company's foundry iron orders for 6000 to 8000 tons of floor grade and from 3000 to 5000 tons of cylinder grade, deliveries up to November. These grades call respectively for 0.04 sulphur, 2.50 to 3.25 silicon and 0.05 sulphur, 1.05 to 1.40 silicon. The bulk of the order went to a leading eastern producer, quotations not being made public. Eastern Pennsylvania iron is moving in small tonnages. Virginia 2X for prompt shipment has been sold at $45 furnace, with No. 2 plain quoted 25 cents lower. These tonnages have been small, as the two leading producers are virtually out of the market. A fair tonnage of special Virginia iron, 3 to 4 per cent silicon, brought $45 furnace. Steel-making irons are slow and the dragging sales of standard low phosphorus show no change from last week, $75 to $80 being obtained. Basic iron is quoted nominally at $42.50, with no transactions reported. Small tonnages in different grades are bringing good prices. One small lot of malleable iron was sold at $50 and another of Eastern Bessemer at $51 Philadelphia. Gray forge advanced 25 cents on a sale of 1000 tons at $42.50 furnace. Standard brands, delivered in buyers' yards, range about as follows:

Eastern Pa. No. 2X foundry	46.75 to 47.75
Eastern Pa. No. 2 plain	46.25 to 47.25
Virginia No. 2X foundry	47.75 to 48.75
Virginia No. 2 plain	47.25 to 48.25
Basic	42.50
Gray forge	43.25 to 44.25
Low phosphorus	75.00 to 80.00

Iron Ore.—Ore imports at this port are reported as follows for May by the Customs Service: 23,671 tons iron ore, valued at $87,330; 1001 tons ferromanganese, valued at $123,901.

Structural Material.—Important eastern independent interests, while they are maintaining a nominal price of 4½ cents, base, Pittsburgh, are taking no business whatever save specifications on contracts. One mill explains that it has not opened its books for next year, as it is certain present orders, probably displaced by Government work to a considerable degree, will run over into the first quarter. That this mill's price is purely nominal can be seen from the fact that it declined an offer of 7½c. for 2000 tons for last quarter of this year or first quarter of 1918. Other interests, also quoting 4½c., base, Pittsburgh, report little new trade in the market, as civilian buyers are holding back. Fabricating shops in this territory have been sounded on a proposal to co-operate in furnishing material for central distributing points under the Government plan to create a merchant marine, and the adoption of such a plan means a still further reduction in ordinary business to be accepted.

Ferroalloys.—Ferromanganese is showing added strength, and current quotations are $450 to $460 for prompt or third quarter delivery. For the fourth quarter, the ruling price is $425, with $400 asked for the first quarter of 1918. Transactions are comparatively small. Spiegeleisen is being quoted at $80 to $82.50 furnace for the remainder of the year, and from $77.50 to $80, furnace, for first half 1918. Ferrosilicon is temporarily out of the market, owing to labor difficulties at producing points.

Old Materials.—Effects of the steel scrap market conditions in Pittsburgh were marked in local iron and steel scrap transactions to-day. Increases running from $1.50 to $5 were noted all along the line, and prices given in the morning were upset before night. Wrought iron and soft steel pipe seems to be the commodity which is of most interest to eastern mills just now, but Pittsburgh seems to be able to absorb almost anything and a great deal is being shipped west. The market has been very spasmodic and material has been scarce. One inquiry to-day was for 1000 tons of old car wheels, and "better than $32" was offered for the full amount. Though prices in eastern Pennsylvania have been lagging behind the prices paid for shipment to Pittsburgh, there was a general stiffening to-day. This makes quotations for eastern Pennsylvania, taking the freight rate at 50c. to $1.50 per gross ton, about as follows:

No. 1 heavy melting steel	$32.50 to $35.00
Old steel rails, rerolling	40.00 to 42.00
Low phosphorus heavy melting steel scrap	45.00 to 48.00
Old iron rails	45.00 to 50.00
Old carwheels	35.00 to 36.00
No. 1 railroad wrought	50.00 to 52.00
No. 1 forge fire	24.00 to 26.00
Bundled sheets	24.00 to 25.00
No. 2 bushelings	17.50 to 18.00
Machine shop turnings	18.00 to 20.00
Cast borings	22.50 to 23.50
No. 1 cast	32.00 to 35.00
Grate bars, railroad	20.00 to 21.00
Stove plate	20.00 to 22.50
Railroad malleable	30.00 to 32.00
Wrought iron and soft steel pipe	35.00 to 37.50

Coke.—Prices show considerable variation, due most probably to special conditions affecting individual sales. One house reported sales of foundry coke at $10 to $10.50 at the oven; another reports being unable to quote on no less than eight inquiries ranging from prompt to 12 months' delivery. The best quotation for prompt foundry coke is $11 to $12, and one considerable producer gave $11.50 flat as the price to-day. Spot furnace coke was reported to-day at $10.25.

Sheets.—Blue annealed sheets, No. 10, are still held at 8c., base, Pittsburgh, but the chief interest in sheets is the disposition, still to come, of the American Car & Foundry Company's inquiry, which is understood to be for Government use. Mills in this territory have made answer to this inquiry, and such proportions as may be obtained will constitute about all the new business they expect to take on for the remainder of the year.

Plates.—Buyers are apparently exerting increased pressure on the mills, with little effect. Large offerings have been turned away and the mills seem disposed to hold more closely than ever to the plan of taking specifications from regular customers only. A fair volume of contracts is reported for the week, subject to the previous announcement that they must be specified during the third quarter. It is difficult to say what the market prices actually are, but 10c., base,

Pittsburgh, is apparently the minimum for ordinary tank steel, with 12½c., base, Pittsburgh, for Lloyds' boat steel. An order for Lloyds' boiler steel was placed during the week at 15c. Locomotive builders and railroad companies share with the shipyards in the demand for material from mills which have their full output sold for almost a year ahead.

Cleveland

CLEVELAND, OHIO, June 12, 1917.

Iron Ore.—Plans for the creation of a clearing house to minimize as much as possible delay to cars and ships and insure to blast furnaces a steady and regular supply of ore have about been worked out by the executice committee appointed last week as a subcommittee of the Committee on Iron Ore, Pig Iron, and Transportation named some time ago by the Council of National Defense. This executive committee appointed last week consists of the following: Harry Coulby, president Pittsburgh Steamship Company, chairman; E. W. Oglebay, Oglebay, Norton & Co.; W. G. Mather, Cleveland-Cliffs Iron Company; Matthew Andrews, M. A. Hanna & Co., and Frank Billings, Tod-Stambaugh Company. The executive committee has held several meetings in Cleveland and definite action putting the plan into effect will probably be taken at a meeting of the ore shippers, vessel and railroad men to be held in Pittsburgh to-morrow. The plan is in no sense a pooling arrangement. A commissioner has been appointed as chairman of the clearing house committee and quarters will be provided where daily meetings can be held. It is expected that by planning ahead and exchanging information it will be possible to obviate the loading of ore by a number of shippers for one consignee on the same day and make the distribution of ore much more even. At a meeting of the executive committee to-day plans for an ore clearing house were completed, and Fred C. Baird, commissioner of the recently organized Coal Exchange, was selected as commissioner. The appointment will be formally approved at a meeting of the operating railroad vice-presidents in Pittsburgh Wednesday. The activities of the two clearing houses, which have a similar object, will be conducted from offices to be opened in the Perry-Payne Building, this city. Ore on Lake Erie docks, June 1, amounted to 4,121,305 gross tons as compared with 3,468,067 tons on the same date of a year ago. Ore receipts at Lake Erie docks this season up to June 1 were 4,147,961 gross tons, a decrease of 4,661,970 tons as compared with the same period a year ago. Shipments from Lake Erie docks to the furnaces during May aggregated 3,991,923 tons as compared with 5,124,176 tons in May, 1916. During April and May the dock balance decreased 2,620,702 tons as compared with a decrease of 1,451,926 tons in the same months last year. The car supply is still unsatisfactory and some ore is being placed on docks that would otherwise go directly to furnaces. While the market is not active a number of sales in small lots are reported. A fair amount of ore is still for sale for delivery this year. We quote the prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—Prices have again advanced sharply on all grades and there is a large volume of inquiry, mostly for foundry iron for the first half of next year's delivery. Bessemer iron has jumped $5 a ton, a sale of 1000 tons having been made at $55 by a Cleveland firm for early delivery to an Ohio consumer. Foundry iron has been marked up $5 or more to $50 for No. 2 on contract and has sold as high as $53 for a carload for prompt shipment. Low phosphorus iron has advanced to $80 for early shipment, at which price several small-lot sales have been made. Probably slightly lower prices would be quoted for future delivery. Several inquiries for low phosphorus iron in lots of 500 to 1000 tons are pending. The Follansbee Brothers Company, which recently bought 6000 tons of basic iron, is in the market for 18,000 tons of basic for the first half and the American Steel Foundries is inquiring for 10,000 tons for the fourth quarter. The Westinghouse Electric & Mfg. Company has an inquiry out for foundry iron requirements for its Cleveland plant for the first half, which will probably amount to about 12,000 tons. Foundry and malleable iron is quoted at $50 by Cleveland and other Lake furnaces, with little available for delivery before next year. There is an occasional inquiry for foundry iron for the last half of next year, but furnaces are refusing to quote that far ahead. We note the sales of two lots of malleable iron for Cleveland delivery—1000 tons for the last quarter of this year, and 200 tons of spot iron at $50. A Lake furnace has sold 500 tons of malleable iron at $48 for shipment to New England. Sales of foundry iron are also reported for $50 for No. 2. We quote, f.o.b. Cleveland, as follows:

Bessemer	$55.95
Basic	50.30
Northern No. 2, foundry	50.30
Southern No. 2 foundry	$44.00 to 46.00
Gray forge	48.95
Ohio silvery, 8 per cent silicon	56.62 to 61.62
Standard low phos., Valley furnace	75.00 to 80.00

Coke.—The foundry coke market is very firm, but not active. Standard Connellsville foundry coke is quoted at $11.50 to $12 per net ton at oven for prompt shipment and producers generally declined to quote contract prices.

Finished Iron and Steel.—Many implement manufacturers and other steel bar consumers are trying to contract for steel for the first half of next year, but the mills are refusing to quote prices. There is also a fair volume of current demand but consumers in many cases are unable to secure quotations, as mills are not in a position to take on additional material. The demand for plates continues heavy and the Cleveland price has been advanced to a minimum of 10c., Pittsburgh, for tank plates. One Cleveland plate mill is sold up so far ahead that it has withdrawn from the market temporarily. Cleveland bar iron mills have withdrawn from the market because of the high price of scrap. Before their withdrawal they made sales last week at 4.25c. The demand for black and blue annealed sheets from the automobile trade and other manufacturers is tremendous. Inquiries are largely for last half requirements, but some consumers are trying to buy round lots for next year's delivery. We quote sheets for immediate specifications at 8.25c. to 8.50c., Pittsburgh, for No. 28 black; 8c. to 8.50c. for No. 10 blue annealed; and 10c. to 10.50c. for No. 28 galvanized. Cleveland warehouse prices have been advanced to 5.25c. for steel bars; 5c. for structural material; 9c. for plates, and 8c. for blue annealed sheets.

Bolts, Nuts and Rivets.—The demand for bolts and nuts continues fairly heavy. Rivet specifications are very heavy from shipyards and a large tonnage will be shortly distributed to meet the Government requirements for its ship-building program. Prices are unchanged at 4.75c., Pittsburgh, for structural, and 4.85c. for boiler rivets for June shipment, with a $3 advance for the third quarter. Bolt and nut discounts are as follows:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 40 off; cut thread, 35 and 2½; larger or longer, 25. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40; larger and longer, 30. Lag bolts, cone point, 45. Square h. p. nuts, blank, $2.10 off list; tapped, $1.90 off list. Hexagon, h. p. nuts, blank, $1.90 off; tapped, $1.70 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.60 off; tapped, $1.40 off. Cold pressed semi-finished hexagon nuts, 50 and 10 off.

Old Material.—The excitement in the scrap market is unabated and there appears to be no limit to the advance in prices. Heavy melting steel and several other grades have advanced $10 a ton in two weeks. Several sales of heavy melting steel, including 500 tons to a Cleveland mill, were made at $38 during the latter part of the week and later this grade brought $40. Dealers are now asking $42 to $45. The price appears to be of secondary importance if the material is to be had and dealers are buying scrap at $5 a ton higher than the mills are willing to pay. The New York Central Railroad on its list that closed Friday was offered $41 for heavy steel scrap, but had none to sell. This road sold its railroad malleable scrap at $35 and

will get about $50 for its railroad wrought scrap. No. 1 cast has sold at $29 in this district. We quote f.o.b. Cleveland, as follows:

	Per Gross Ton
Steel rails	$37.00 to $38.00
Steel rails, rerolling	44.00 to 45.00
Steel rails, under 3 ft	42.00 to 42.50
Iron rails	44.00 to 45.00
Steel car axles	50.00 to 55.00
Heavy melting steel	38.00 to 40.00
Carwheels	32.00 to 33.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	28.00 to 29.00
Railroad malleable	34.00 to 35.00
Light bundled sheet scrap	23.00 to 24.00
	Per Net Ton
Iron car axles	$53.00 to $55.00
Cast borings	17.00 to 18.00
Iron and steel turnings and drillings	16.00 to 16.50
No. 1 busheling (normally)	21.00 to 22.00
No. 1 railroad wrought	38.00 to 40.00
No. 1 cast	27.00 to 29.00
Railroad grate bars	19.00 to 20.00
Stove plate	18.50 to 19.00

Cincinnati

CINCINNATI, OHIO, June 12, 1917.

Pig Iron.—The scarcity of iron in the different producing districts has brought out a number of frantic inquiries from melters who are not well covered for the future. In the South, practically all high-grade iron has been sold that can be moved this year and the percentage of off grade iron to be had is rapidly diminishing. The same condition exists in the Hanging Rock district except that it is more marked, and it would be difficult to obtain any iron there for shipment this year. Prices have advanced rapidly and while there are no open quotations, $45, Ironton, is now considered absolute minimum for such iron that can be moved before Jan. 1. All the way from $45 to $47, Ironton, is quoted for the first half of next year. Southern iron is quoted for this year's shipment at $40 to $42, Birmingham basis, and at $40 for the first half of 1918. A number of contracts have been made for next week at $40 and at the present time most consumers do not hesitate to contract for a first half supply wherever it can be obtained. A number of Southern furnaces have withdrawn from the market entirely and there is a scramble to pick up odd lots that heretofore have not been openly offered. A good-sized tonnage of Northern basic was sold in St. Louis territory last week for first half shipment. A central Ohio manufacturer is expected to close this week for 1000 tons of mixed Northern and Southern foundry grades. A comparatively large number of offers are in hand from Ohio, Indiana and Michigan melters, but few of them are accepted. The strike at the Jackson County furnaces has been settled. Globe and Jisco furnaces have resumed operation and Star furnace has blown out for relining. Based on an 8 per cent analysis, Ohio silvery for shipment in the first half of next year is quoted at $55 to $60 at furnace. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft	$43.40
Southern coke, No. 2 f'dry and 2 soft	42.90
Southern coke, No. 3 foundry	42.40
Southern coke, No. 4 foundry	41.90
Southern gray forge	33.90
Ohio silvery, 8 per cent silicon	56.26
Southern Ohio coke, No. 1	46.76
Southern Ohio coke, No. 2	46.26
Southern Ohio coke, No. 3	45.76
Southern Ohio malleable Bessemer	46.26
Basic, Northern	46.26
Lake Superior charcoal	54.75
Southern carwheel foundry	48.90

Finished Material.—The local store price on ¼-in. plates and heavier has been advanced to 9c. and the warehouse price on No. 10 blue annealed sheets is 9c. These are radical changes from previous quotations; all other commodities are unchanged as follows: Steel bars, 4.65c.; twisted steel bars, 4.70c.; structural shapes, 5c.; machine bolts, ⅜ x 4 in. and smaller, 45 per cent discount; larger and longer, 30 and 5 per cent discount; files, 50 per cent discount, and hack saws, 10 per cent discount. The nearby mills quote No. 28 black sheets at 8.15c., Cincinnati or Newport, Ky., and No. 28 galvanized at 10.15c. Business is being done at these figures, but the mills are only taking orders from old customers and are not seeking new trade. The demand for railroad track material is increasing. Hoops and bands are slow, as the mills are unable to make shipments.

Coke.—The market is in a somewhat disturbed condition, due to the reluctance on the part of the oven operators to take on much more future business. However, the foundries are understood to have bought ahead and nothing except fill-in orders are looked for from this source for some time to come. There is no demand for furnace coke, and as a consequence it is hard to arrive at a fair average quotation. For prompt shipment, Connellsville operators are asking for 48-hr. coke all the way from $9.50 to $10.50 per net ton at oven. Prompt foundry coke ranges from $11.50 to $12, although as low as $10.50 has been done lately on a few scattered carloads. The same condition exists in the Wise County and Pocahontas fields. New River foundry coke is very firm for nearby shipment at $12 to $12.50 per net ton at oven.

Old Material.—The market is advancing so rapidly that it is difficult to keep up with it and to name fair average prices that can be obtained on different grades of scrap just at the present time. No. 1 railroad wrought is now quoted at $35 to $35.50 per net ton. Iron axles have been advanced to $43.50 to $44 and are still going up. Railroad cast scrap is around $27. These are only a few grades that have taken sharp advances. Local dealers report that the steel foundries and also the rolling mills are buying heavily. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

	Per Gross Ton
Bundled sheet scrap	$22.50 to $23.00
Old iron rails	34.50 to 35.00
Relaying rails, 50 lb. and up	39.50 to 40.00
Rerolling steel rails	39.50 to 40.00
Heavy melting steel rails	33.00 to 33.50
Steel rails for melting	32.50 to 33.00
Old carwheels	31.50 to 32.00
	Per Net Ton
No. 1 railroad wrought	$35.00 to $35.50
Cast borings	12.00 to 12.50
Steel turnings	12.00 to 12.50
Railroad cast	27.00 to 27.50
No. 1 machinery cast	27.50 to 28.00
Burnt scrap	15.00 to 15.50
Iron axles	43.50 to 44.00
Locomotive tires (smooth inside)	35.75 to 36.25
Pipes and flues	19.50 to 20.00
Malleable cast	21.50 to 22.00
Railroad tank and sheet	19.50 to 20.00

Birmingham

BIRMINGHAM, ALA., June 11, 1917.

Pig Iron.—Some dealers say that $38 for first half of 1918 may possibly be done in exceptional instances yet, but no manufacturer admits willingness to sell at that figure. In fact, the $38 level apparently was eliminated during the latter part of the week, when a consumer, who several days before had been quoted $38 on 1918 iron and failed to immediately order, was wired that $40 was the minimum. He tried to take the iron at $38, but failed. A small tonnage for last half to a regular customer went at $42. A hundred tons or so of high Clifton for last quarter brought $42.50, a $40 basis for regular No. 2 foundry. The leading interest, the Alabama Company and perhaps one other interest are out of spot and last half metal, and no company has much. Spot is scarce and brings $40 to $42 and even higher when brokers' fees must come out in addition. The leading foundry interest and another large concern quote a minimum of $42 for last half and last quarter. This would, of course, be scaled if last quarter orders extended into 1918. All things told, $40 is about a minimum for the remainder of this year, with $42 paid on small lots by new customers. As for 1918 the minimum is hardening around $40, and $50 iron is predicted when buying sets in for the last half of the year. While Alabama's output reached a new high level in May, almost 260,000 tons, shipments kept pace, so that accumulations on the yards increased but 2000 tons or so during that period. Warrants are lower than they have been in years, being something like 50,000 tons. While there may be 150,000 tons of free foundry on the yards, it has been sold and is simply delayed in delivery. One concern, for instance, is due to deliver this month 60,000 tons, which is double its make and about twice what it will be able to move in

all probability. We quote per gross ton, f.o.b. Birmingham district furnaces, for nearby delivery, as follows:

No. 1 foundry and soft	$40.50 to $42.50
No. 2 foundry and soft	40.00 to 42.00
No. 3 foundry	39.50 to 41.50
No. 4 foundry	39.25 to 41.25
Gray forge	39.00 to 41.00
Basic	40.00 to 42.00
Charcoal	45.00 to 47.00

Steel Bars.—Steel bars in car lots, f.o.b. Birmingham, 3.75c. to 4.00c.; iron bars, 3.50c. to 3.70c.

Cast Iron Pipe.—Little more has been heard from Government business, but more is expected as the cantonments start building, each requiring about 200 tons. Fill-in orders by those who must mave pipe keep things going as usual in spite of high prices. Another advance in quotations is imminent. We quote per net ton, f.o.b. Birmingham district pipe shop yards, as follows: 4 in., $56; 6 in. and upwards, $53, with $1 added for gas pipe and extra lengths.

Coal and Coke.—The car shortage holds back delivery of coke to distant points, but the home consumption cares for normal output. Cattle cars are used in coke shipments. Prices remain firm at the high levels of some time past. Furnace coke is at $6 to $8 and standard foundry at $12.50 to $14, f.o.b. ovens.

Old Material.—The scrap market is extremely active and the local consumption cares for an immense amount of cast, while all grades are in strong demand to the extent of freight service and more. All items are up $1 additional this week. We quote per gross ton, f.o.b. dealers' yards, as follows:

Old steel axles	$40.00 to $42.00
Old steel rails	21.50 to 22.50
No. 1 wrought	23.50 to 24.00
No. 1 heavy melting steel	19.00 to 20.00
No. 1 machinery cast	23.50 to 24.50
Car wheels	24.00 to 25.00
Tram car wheels	17.00 to 17.50
Stove plate and light	16.00 to 17.00
Turnings	12.00 to 12.50

St. Louis

ST. LOUIS, MO., June 11, 1917.

Pig Iron.—The extreme prices for pig iron have brought about a cessation of extensive demand in this market, though there is still considerable call for small lots from melters who are in a position where they must have material regardless of the price. The transactions closed during the week aggregated probably 4000 tons in lots ranging downward from 300 tons and practically all for first half delivery in 1918. None of the furnaces seems to have even the smallest amounts available for last half delivery, although values for that delivery are being put at $40 to $41, Birmingham, for No. 2 Southern foundry. For first half delivery, the price range seems to be from $38 to $40, but as everything is put up to the furnaces, none of the prices given can be truthfully called quotations. The local furnace is sold as far ahead as any of its competitors in other areas and its prices are conforming to the general conditions. Northern iron and also Chicago brands are out of the market altogether at the present time, and the same is true of Lake Superior charcoal. No transactions are being reported, either, in high silicons or in ferromanganese, though the latter could be sold, if it could be delivered, as the need is great.

Coke.—Practically no contract coke is available in this market, representatives having been notified that their ovens are not in position to enter into future delivery transactions. Some spot coke is being sold in small lots at $12 oven for best selected 72-hour foundry grades. By-product coke, both of local production and from nearby producers, is unavailable because of sold-up conditions existing at the various plants which can deliver in this territory.

Finished Iron and Steel.—In finished products no business is being done for future delivery and customers are being held in line as to existing contracts by the persuasive powers of mill representatives only. Warehouse stocks are beginning to show evidence of difficulty in getting supplies in some classes of material. We quote for stock out of warehouse as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.25c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 8.55c.; No. 28 black sheets, cold rolled, one pass, 8.85c.; No. 28 galvanized sheets, black sheet gage, 10.75c.

Old Material.—The wild condition which existed in the scrap market at last reports has continued. Dealers are, apparently, willing to pay any price that may be asked to meet shortages and a keen gambling spirit is beginning to be evidenced in the market. Quick turnovers are the rule. The local industries are not actively in the market, but are buying in a quiet way whenever material appeals to them and that, too, almost regardless of the price. Very little offered to them is being turned down. The greatest excitement exists in the steel grades, borings and wrought material. Lists out during the week included 700 tons from the Chicago, St. Paul, Minneapolis & Omaha; 3500 tons from the Northern Pacific; 1000 tons from the Mobile & Ohio; 2000 tons from the Union Pacific; 1500 tons from the Southern Railway; 5000 tons from the Big Four, and 500 tons from the Kansas City Southern. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$45.00 to $46.00
Old steel rails, rerolling	45.00 to 47.00
Old steel rails, less than 3 ft	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	34.00 to 35.00
No. 1 railroad heavy melting steel scrap	39.00 to 40.00
Heavy shoveling steel	36.50 to 37.50
Ordinary shoveling steel	35.50 to 36.50
Frogs, switches and guards cut apart	39.00 to 40.00
Ordinary bundled sheet scrap	19.50 to 20.00
Heavy axle and tire turnings	21.00 to 22.00
Per Net Ton	
Iron angle bars	$36.00 to $37.00
Steel angle bars	33.00 to 34.00
Iron car axles	49.00 to 50.00
Steel car axles	47.00 to 48.00
Wrought arch bars and transoms	41.00 to 42.00
No. 1 railroad wrought	39.00 to 40.00
No. 2 railroad wrought	37.00 to 38.00
Railroad springs	33.00 to 34.00
Steel couplers and knuckles	33.00 to 34.00
Locomotive tires, 42 in. and over, smooth inside	45.00 to 46.00
No. 1 dealers' forge	33.00 to 34.00
Cast iron borings	16.00 to 17.00
No. 1 busheling	27.50 to 28.50
No. 1 boilers, cut to sheets and rings	23.00 to 24.00
No. 1 railroad cast scrap	28.00 to 29.00
Stove plate and light cast scrap	17.00 to 18.00
Railroad malleable	27.00 to 28.00
Agricultural malleable	25.00 to 25.50
Pipes and flues	24.00 to 25.00
Heavy railroad sheet and tank scrap	22.00 to 23.00
Railroad grate bars	20.00 to 21.00
Machine shop turnings	18.50 to 19.50

Buffalo

BUFFALO, N. Y., June 12, 1917.

Pig Iron.—Sales for the week probably did not aggregate over 5000 tons. From the viewpoint of the blast furnaces this is entirely satisfactory, as pig-iron producers have very little to sell for any period of shipment this year and are not desirous of selling for the first half of 1918. One of the largest producing interests of the district has virtually withdrawn from the market for all periods of shipment, due to the uncertainty of furnace production because of scarcity of coke and other conditions. The average and minimum of price schedules is at least $1 per ton higher than a week ago. For prompt and 1917 delivery we quote as follows, f.o.b. furnace, Buffalo:

High silicon irons	$49.00 to $50.00
No. 1 foundry	48.00 to 50.00
No. 2 X foundry	47.00 to 50.00
No. 2 plain	46.00 to 47.00
No. 3 foundry	46.00
Gray forge	46.00
Malleable	48.00 to 50.00
Basic	48.00 to 50.00
Lake Superior charcoal, f.o.b. Buffalo	52.00 to 53.50

Finished Iron and Steel.—A very heavy tonnage of finished products has been under inquiry during the week, but the various selling agencies report conditions as increasingly tense, and only a small proportion of the tonnage presented could be taken on, the bulk of the inquiries received being turned down. The principal item was an inquiry from the T. H. Symington Company, Rochester, calling for approximately 14,000 tons of 3¼ in. rounds, to be used in the manufacture of material for a Government contract. Another large inquiry was for approximately 20,000 tons of car build-

ing material in connection with orders for French and Russian cars. It is understood that neither of these tonnages has yet been placed with mills. The agency of one of the leading mills stated that its company had withdrawn from the bar market temporarily because of the scrap material situation and failures in deliveries by scrap dealers, owing in many instances to shortage of cars and of labor to properly sort material. The demand for cold-rolled finished steel has been extremely heavy, and pronounced scarcity for that product is forecast for the near future. Available tonnage even for far forward deliveries is becoming very short, mills now being sold up for five to seven months. There has also been a heavy demand for cement coated nails and several manufacturers have withdrawn from the market. Warehouse prices have advanced $11 per ton on bars and small shapes and $5 per ton on structural shapes and 2c. per pound on plates. The Buffalo Structural Steel Company has received contract for 600 tons of steel for the Pullman Company's car repair shops extensions at Buffalo.

Old Material.—The price advances for the week have been phenomenal and have broken all records. No such tremendous jumps in prices have been known previously in the history of the trade. Heavy melting has gone up $9 per ton; low phosphorus, $4 to $6; wrought pipe, $10, and carwheels $2.50 per ton, some sellers of carwheels asking even greater advances and claiming a range of $32 to $35 would properly represent the market on this commodity. The overwhelming demand for scrap of all kinds, with shrinkage of available supplies because of shortage of cars and labor for handling, has made it very difficult for dealers to furnish tonnages asked for. In some instances, mills are unable to obtain even normal quantities. One reason for this situation is that Government requirements take precedence over other shipments, restricting movement of scrap and preventing dealers from assembling and shipping material in the ordinary volume. It is also stated that in some instances it is apparent that shipments on contracts at old figures are held back to forward materials at the advanced prices. Drastic steps have been taken in some cases to compel fulfilment of deliveries on old contracts, where it is thought shipments are being subverted to higher-priced orders recently taken. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$40.00 to $41.00
Low phosphorus	50.00 to 55.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	50.00
Steel axles	50.00
Car wheels	31.00 to 32.00
Railroad malleable	34.00 to 35.00
Machine shop turnings	17.00 to 18.00
Heavy axles turnings	22.00 to 23.00
Clean cast borings	18.00 to 19.00
Iron rails	38.00 to 40.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	31.00 to 32.00
No. 1 busheling scrap	27.00 to 28.00
No. 2 busheling scrap	18.00 to 19.00
Bundled sheet scrap	20.00 to 21.00

San Francisco

SAN FRANCISCO, June 9, 1917.

With the preference given to Government requirements in steel products, the situation on the Pacific Coast does not appear to be in line for speedy improvement. At present, sheets, ship plates, many wire products, certain classes of tubing, and the larger sizes of bars are almost impossible to get upon any terms. Delays on goods ordered last year are causing much embarrassment to jobbers and builders, and the uncertainty as to prices interferes greatly with legitimate promotion projects. Except on rails, tubing and bars, there is practically no export business in spite of persistent inquiries. It is hard to dispose of municipal bonds when the chief interest is in war bonds; and the volume of public improvement work is exceptionally small, considering the needs of the various communities. It is predicted by San Francisco labor leaders that unless ship building materials for the plants around the bay are immediately forthcoming, in less than 90 days there will be 3000 iron trades mechanics forced into idleness in this immediate vicinity. In consequence of this danger to the welfare of the community, the unions have sent a resolution of protest to Samuel Gompers and the California delegation in Congress in the hope that some action can be taken to remedy the situation.

Bars.—Coast sizes are fairly plentiful, but the sizes less than ⅜ in. and larger than 3 in. are scarce. The base price remains at $4.50, with 25c. extra for small-lot orders. Jobbers quote 3 in. and under at 5.50c.; over 3 in., 6.50c.; twisted steel, 5.50c.; flats, ¼ in. and heavier, 5.50c.; rounds and squares, 3/16 to 5/16 in., 6.25c., and 3/16 and ⅛-in. bands at 6.25c. In order to secure better railroad and water shipping facilities, the Pacific Coast Steel Company is considering the proposition of moving the plant to a new site in this vicinity in the near future.

Structural Materials.—Notwithstanding the curtailed demand for high-class structural, there is a scarcity of material. In many of the large reinforced concrete structures being erected, no fabricated steel whatever is employed. The Government demand for structural is steady, and where necessary considerable tonnage is used in new industrial structures. The demand for small shapes is fair. Jobbers quote angles, channels and tees under 3 in. at 6c.; 3 in. to 15 in., 6.50c., and I-beams, 3 to 15 in., 6.50c.

Plates.—Small shipments of tank plates have arrived recently from the mills, but for the most part there are long delays of shipments. The jobbers' stocks are low on most sizes, and they have only limited quantities for export. Tank plates have to be used in ship repair work at times, owing to the impossibility of getting ship plates. Manufacturers quote for San Francisco delivery ¼-in. tank steel at 7.75c., and jobbers at 8.50c. A score of new shipbuilding companies have been incorporated on the Pacific Coast in the past month, but probably none of these will be able to build steel vessels this year at least.

Sheets.—The mills quote No. 10 blue annealed for third quarter at 7.75c. The same from San Francisco stores sell at 9.50c. Jobbing prices on Nos. 12 and 14, flat galvanized, have risen to 10.44c. No. 28 is quoted at 11.32c. Much business is refused on account of no stock.

Wrought Pipe.—The coast requirements are fully normal on all standard sizes, and the oil country demand is keener than ever. The chance of catching up with orders is more remote than previously reported. Spot stocks are in no immediate danger of exhaustion, however, and jobbers are covering for the distant future. Jobbers quote ¾-in. black pipe at 7.65c. for lots less than 18 tons, and 7.20c. for larger quantities. Galvanized ¾-in. sells at 10c. for the smaller lots and 9.40c. for the larger.

Cast Iron Pipe.—The floating of the Liberty bonds, together with the general inclination to curtail public water works extension, is restricting the demand to purely repair requirements for the most part. Only a limited tonnage has been offered by the Government in the past month also. The price remains at $66 on 4-in. and $63 on 6-in. and larger, Class B and heavier, with a dollar extra for Class A and gas pipe.

Pig Iron.—The foundries are showing an inclination to cover for the first half of 1918, though some are holding off in hope of lower prices. There is a spasmodic activity on spot stocks at very high prices. No. 1 foundry for San Francisco delivery, last quarter, is up to $53. The same for first half of 1918 is quoted by brokers at $50.

Coke.—Some dealers are virtually out of the market, largely on account of shipping difficulties. Foundry at the cars has been sold in the past week at about $20, time delivery. Spot stocks command varying high prices when available. There is not much trading.

Old Materials.—Dealers have been tempted by the high prices to sell heavily, and supplies at present are

not large. The paper quotations are apt to be unreasonably high. Machinery scrap is reported sold at $32.50, but in no large quantities. Miscellaneous steel scrap sells between $20 and $25, and heavy melting up to $32.50.

British Steel Market

Tin Plate Higher and a Stock Census Ordered—Pig Iron Firm

(*By Cable.*)

LONDON, ENGLAND, June 13, 1917.

The pig-iron market is generally firm. South Staffordshire low grade forge iron has been officially advanced 5s. Hematite iron is strong and so are tin plates, which are quoted at 35s. basis. A census has been ordered of all tin-plate stocks. Ferromanganese is nominal and semi-finished steel is neglected. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 35s. against 34s. one week ago.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.

Large Iron Ore Output—Ferromanganese Growing Scarcer—Tin Plates Higher

(*By Mail*)

LONDON, ENGLAND, May 25, 1917.—The outlook in the British iron and steel situation undergoes no great change. Conditions as regards raw material are fairly satisfactory, though supplies of foreign ores continue to show considerable irregularity. Deliveries on the East Coast are coming forward as rapidly as the tonnage position permits and coke supplies seem equal to current needs. The home output of ores is being increased steadily.

Export business generally has been more circumscribed, especially in finished steel. Allied Government war needs are being studied apart from their requirements in pig iron, which are still considerable and very difficult to satisfy.

There is no alteration in pig-iron conditions. The long delay in getting a revision of maximum pig-iron prices, due to increased costs, has caused irritation among ironmasters. Consumers are not keen to contract for fresh tonnage subject to any official change in the maxima, but producers will not sell otherwise. The allocation of Cleveland iron to home consumers is fully adequate with an ample supply. There is more doing in the Scotch trade both for foundry and forge descriptions and the export movement is improving. The outlet for hematite is wide and the distribution of supplies closely controlled.

The position of semi-finished steel is as stringent as ever. Welsh bars remain officially at £10 7s. 6d., which rate is also readily paid for the limited quantities of shell discard billets. The deadlock in American material continues, offers of billets being very rare. The market is entirely nominal, although limited quantities of wire rods have been handled lately for summer shipment at about £28 c.i.f. Liverpool, which is now asked for next quarter.

The demand for finished material continues to outstrip the supply with a growing outlet for shipbuilding steel, while the construction program is making more rapid progress. The working capacity of steel plants is used to its fullest extent, since ships are almost as urgently needed as shells and guns. In those classes of material which are not under price control, stringency has been more marked. The association of mild steel wire makers has raised its basis price by £5 a ton, due to a huge demand, and makers are hard pressed.

Ferromanganese and Manganese Ore

The difficulty of satisfying current demands for ferromanganese has lately become intensified through the growing scarcity of offers, very little now being obtainable at any price. The market is extremely divergent, anything like reliable quotations being out of the question. Producers, of course, have their output earmarked far ahead. It is also more difficult to get hold of licenses, while a larger portion of the output is reserved for domestic use. F.o.b. quotations for export loose are about £42 to £45, and parcels have changed hands at the latter figure for shipment to Scandinavia. The position of Indian manganese ores is complicated through tonnage difficulties.

The tendency of tin plates is strongly upward, due to an unabated demand for war work and a further contraction of offers, makers being fully booked into August. Trading restrictions are unrelaxed, while the output is barely equal to essential needs. Quotations are now on the basis of fully 31s. per basis box, f.o.b. The Swansea warehouse stocks and makers' holdings are falling steadily, and a substantial premium is being realized for stock lots obtainable without certificates. The stiff attitude of makers is explained by the reduced allocations of steel and high costs, including the advance in tin. Makers of oil plates are fully booked and are out of the market.

New York

NEW YORK, June 13, 1917.

Pig Iron.—In addition to the inquiries for steel making irons for export mentioned last week, another for 10,000 tons of basic for shipment to Japan has appeared, but there is no immediate prospect that any of this tonnage will be closed. It is understood that the few sellers who were able to quote at all are asking about $48 for basic and the foreign buyers are slow to contract at that figure. About 2000 tons of charcoal iron had been sold at $50 furnace for first half of 1918. The foundry iron market is very strong and prices are higher. Eastern Pennsylvania iron has been sold as high as $47.75, tidewater, for delivery this year and $45.75 for delivery the first half on next year. Prices on Buffalo iron are not very well defined, but the usual quotation is $50, furnace, for No. 2 foundry for this year and $48 for next year. Very little Alabama iron is on the market, but sales have been made this week on a basis of $40, furnace, for No. 2, for delivery the first half of next year. Virginia furnaces are not disposed to quote for next year's delivery at the present time, but one furnace has named $47.50, furnace, for delivery the first half of 1918. No sales have been made at that high quotation. We quote tidewater for early delivery as follows:

No. 1 foundry	$47.25 to $48.25
No. 2X	46.75 to 47.75
No. 2 plain	46.25 to 46.75
Southern No. 1 foundry	44.75 to 45.75
Southern No. 2 foundry and soft	44.25 to 45.25

Shapes and Bars.—Contracts or even inquiries for structural material for office buildings, apartment houses and lofts are reported as fewer in both volume and number than in any time in the past seven years. Even projects of this nature which have been before the market in the past month or so have been allowed to drop completely. Government work seems to be the only kind that receives serious consideration, and results in new business and even the volume of this are not especially large. It is understood that the steel for the two power houses for the Norfolk and League Island Navy Yards, requiring 2000 tons, will be furnished by the Virginia Bridge & Iron Works. The steel for the Government magazine and shell building at St. Julian Creek, 800 tons, will be furnished by William F. Pottoff. The Newport News Shipbuilding & Dry Dock Company has awarded 1100 tons to the Virginia Bridge & Iron Company for a turbine shop and is still in the market for 8000 tons for shipways and crane runways. Lewis F. Shoemaker & Co. have taken 300 tons for steel work for the Pennsylvania Railroad for extensions to various buildings and for a car shop at Steelton and Altoona. The Pennsylvania Railroad has also recently allotted to various fabricators 1000 tons for various bridges and repair work, one lot consisting of 600 tons for four bridges. It is reported that the McClintic-Marshall Company has taken 800 tons of

shapes for the Panama Canal zone. The Pennsylvania Railroad is inquiring for 200 tons for a bridge at Reading and the Philadelphia & Reading for 150 tons for two small bridges. Bar iron is selling at a range of 4c. to 4.25c., Pittsburgh, and many of the mills have several months' bookings. Warehouse prices are again higher, $5 per ton in steel bars and structural material and $3 per ton in bar iron. We quote plain material from mill at 4.419c. to 4.919c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. For future shipments, 4.169c. seems to be the minimum. Shipments from warehouses are 5c. to 5.25c. per pound, New York. We quote steel bars in mill shipments at 4.419c. to 4.669c., New York, and iron bars at 4.169c., New York. From New York district warehouses iron bars are sold at 4.75c. and steel bars at 4.75c. to 5c.

Steel Plates.—For boiler plates for the third quarter to a domestic consumer 10c. has been paid for 5000 tons and negotiations are about completed on 7000 tons, possibly tank quality, also for 10c. A 30-ton lot of tank plates for delivery in two months has been placed at 9c. The export demand for ship plates is illustrated in the plaint of a representative of a Chinese yard who has now decided in a matter of 1500 tons that he will have to start on a journey to the mills even to secure delivery in the first quarter of next year. For ship plates 11c. to 11.50c. is talked of. A fresh inquiry of 25,000 tons of shapes and plates for ship repair work for France is noted. Following an advance of $10 per ton last week by warehouses may be noted an advance this week on top of it of $20 per ton. On mill shipments of universal and tank plates the range is 8.169c. to 9.169c., New York, with tank plates probably a minimum at 8.669c. and ship plates higher than 10c. Pittsburgh basis rather than lower. Plates out of store are 8c. to 9c., New York.

Old Material.—The Eastern market, which was very slow to respond to the heavy buying of the Central West, but was very strong with advancing quotations last week, has been very much excited during the past few days and nearly every grade of scrap has been advanced from $5 to $7. Heavy melting steel for shipment to Pittsburgh is about $9 per ton higher than it was a week ago. This advance is attributed to the very large orders placed in the Pittsburgh district. The demand for wrought scrap is also extremely active and wrought iron pipe is selling under the new specifications at about $10 above the recent quotations on the old specifications. Brokers quote buying prices as follows to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$29.00 to $30.00
Old steel rails (short lengths) or equivalent heavy steel scrap	38.00 to 39.00
Relaying rails	55.00 to 60.00
Rerolling rails	40.00 to 45.00
Iron and steel car axles	54.00 to 55.00
No. 1 railroad wrought	48.00 to 49.00
Wrought-iron track scrap	43.00 to 44.00
No. 1 yard wrought, long	36.00 to 37.00
Light iron	7.50 to 8.00
Cast borings (clean)	17.00 to 18.00
Machine-shop turnings	17.00 to 18.00
Mixed borings and turnings	14.00 to 15.00
Wrought-iron pipe (1 in min. diameter, not under 2 ft. long)	29.00 to 30.00

Foundry grades of scrap have not been so excited as steel mill material, but the market is active and prices are higher. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, New York:

No. 1 machinery cast	$35.00 to $36.00
No. 1 heavy cast (column, building material, etc.)	34.00 to 35.00
No. 2 cast (radiators, cast boilers, etc.)	29.00 to 30.00
Stove plate	18.00 to 18.50
Locomotive grate bars	18.50 to 19.00
Old carwheels	32.00 to 33.00
Malleable cast (railroad)	26.50 to 27.00

Cast-Iron Pipe.—Municipalities continue to remain out of the market to a large extent and the only new inquiry that has appeared is for 500 tons of 6-in. for Boston, on which bids are to be received June 15. All cast-iron pipe manufacturers are dealing with the Government through an agent stationed at Washington, and it is expected that contracts will soon be placed for a considerable tonnage of pipe for the army cantonments. Carload lots of 6-in., class B and heavier, are quoted at $58.50 per net ton, tidewater, with class A and gas pipe taking an extra of $1 per ton.

Ferroalloys.—With the sinking early this month of the British steamship Southland, at least 1000 tons of ferromanganese for consumption in the United States went to the bottom. This is the first serious loss reported since the war started. Receipts in May are believed to have been considerably less than the average of over 6000 tons for the first four months of this year, but it is reported that both licenses and shipments are keeping up well at the present time and there is no reason to think that imports will be greatly reduced in the near future unless the torpedoing of cargoes should occur again. The market is quiet but strong and domestic alloy is quoted at $425 to $450, delivered, for last half, and $450 for prompt and early delivery metal. Users are urgent in calling for shipments on contracts, but inquiries and sales of small lots are fewer than for some time. Spiegeleisen continues strong at $80 to $85, furnace, for delivery this year. For 50 per cent ferrosilicon consumers are asked to pay anywhere from $200 to $250 for any deliveries this year.

Pacific Coast Steel Company to Start Irondale Furnace

After an idleness of almost five years, the blast furnace of the defunct Western Steel Corporation, at Irondale, Wash., about 50 miles from Seattle, is being placed in working condition. The Pacific Coast Steel Company of Seattle, of which William Piggott is president, has taken the property. It is estimated that between $75,000 and $100,000 will be expended, and that in sixty days the furnace will be ready to blow in. All the old inclosing structure has been removed and will be replaced with new, and the ore and coke elevator is being overhauled. Considerable work will be necessary on the engines and machinery. The wharf of the old steel plant has been practically rebuilt, the new work requiring the driving of 600 creosoted piles and entire replanking of the dock floor. The dock has a frontage of 400 ft., and formerly accommodated the large vessels of the Robert Dollar Company, which brought iron ore from China. Several of the old company's larger buildings are being completely overhauled, and a number of new dwellings are under construction.

Approximately 1,000 tons of Chinese iron ore from Tayeh mines of the Hanyang Iron Works on the Yangtse River, is now in the furnace yard, and will be used in the first furnace operation. Arrangements are being made for additional supplies of iron ore. The furnace has a capacity of 60 tons a day. E. L. Hershey, lately connected with the Pulaski Iron Company, Pulaski, Va., has been made superintendent and is in charge of the work now in progress.

Winchester Gets Cartridge Contract

The Winchester Repeating Arms Company of New Haven, Conn., has been awarded by the United States Government a contract for $100,000,000 worth of small arms cartridges. There are to be 320,000,000 cartridges, which will be made to fit the United States Springfield or the rechambered Enfield rifle. J. E. Otterson, general manager of the company, said that although the order will be distributed among several concerns, the Winchester force will be increased from 11,000 to 20,000 men.

Rodney Thayer, president of the Penn-Seaboard Steel Corporation, has written a letter to stockholders saying that the sale of the Seaboard steel castings plant in Chester, Pa., to the American Locomotive Company was an advantageous transaction in every way. The locomotive company for many years had bought about 50 per cent of the plant's output and had expressed its intention to build or buy a plant of its own. It is understood that S. Everett Sproul, who has been in charge of the Seaboard plant for 15 years, will be retained as manager, with David S. Stokes as his assistant.

IRON AND INDUSTRIAL STOCKS

General Trend Upward—Confidence in Business Conditions Prevails

NEW YORK, June 13, 1917.

The past week was not one of sensations on the Stock Exchange, but there was considerable activity and 1,038,800 shares of steel common changed hands. On the whole, the trend was upward. Possible effects of the placing of the Liberty loan are still discussed, but the more important influence in the market at the present time is a very strong feeling that business activity will prevail for many months. The demand for all leading products is strong, prices are advancing and there does not seem to be the slightest reason for fearing industrial depression. The placing of very large orders by the Government will, of course, cause annoyance to buyers whose deliveries are delayed on account of the Government demand, and there may be a temporary slackening of business here and there. United States Steel last week made a net gain of 3 points; Republic, 2⅜; Lackawanna Steel, 5¼; Bethlehem Steel, 7½, and Baldwin Locomotive, 4¾. American Locomotive barely held its own, making a gain of ⅞ of a point. Pressed Steel Car also gained only ½ point. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	28½- 31	Gulf S. Steel....	125 -129
Allis-Chal., pref.	84⅝- 86½	Int. Har. of N. J., com.	115 -117½
Am. Can, com...	49 - 53	Int. Har. Corp., com.	70½- 71
Am. Can, pref...	108½-111½	Int. Har. Corp., pref.	103¼
Am. Car & Fdy., com.	74 - 78	Lacka. Steel	97⅝-102½
Am. Car & Fdy., pref.	116 -118½	Lake Sup. Corp..	20 - 21⅜
Am. Loco., com..	72⅝- 76⅜	Lukens Steel, 1st pref.	103 -104
Am. Loco., pref..	104½-104¾	Midvale Steel...	63¼- 67½
Am. Rad., com..	282½-285	Nat.-Acme	31⅛- 32¼
Am. Ship, com...	77½- 79½	Nat. Enam. & Stm., com.	37½- 42⅜
Am. Ship, pref..	94 - 94½	N. Y. Air Brake.	148 -155⅞
Am. Steel Fdries.	72 - 73⅞	Nova Scotia Stl.	94½
Bald. Loco., com.	64½- 69⅛	Pressed Stl., com.	77½- 80¼
Bald. Loco., pref.	99 -102½	Pressed Stl., pref.	103
Beth. Steel, com.	145 -155¾	Ry. Steel Spg., com.	53⅝- 58
Beth. Steel, class B	139½-153	Ry. Steel Spg., pref.	98⅞- 99
Beth. Steel, pref.	120 -121	Republic, com. ..	90½- 94½
Cambria Steel...	149 -160	Republic, pref...	105 -105¼
Carbon Stl., com.	103 -108	Sloss, com.	58⅜- 63⅜
Case (J.I.), pref.	85	Sloss, pref.	95
Central Fdry., com.	31 - 35⅛	Superior Steel...	45⅛- 48⅞
Central Fdry., pref.	51½- 54⅛	Sup. Steel, 1st pref.	101 -101⅛
Charcoal Iron, com.	87⅛- 91¼	Transue-Williams	45½- 48½
Charcoal Iron, pref.	63⅝- 61½	Un. Alloy Steel..	45⅞- 49⅜
Chic. Pneu. Tool.	71 - 78	U. S. Pipe, com..	23 - 24⅛
Colo. Fuel	53¼- 58	U. S. Pipe, pref.	58
Cruc. Stl., com..	78¾- 84⅝	U. S. Steel, com.	129¼-134⅛
Cruc. Stl., pref..	106¼-108	U. S. Steel, pref.	116⅜-118¾
Deere & Co., pref.	99 - 99⅛	Va. I. Co. & Coke	69 - 71
Gen. Electric....	162 -164¾	Warwick	9 - 9⅛
Gt. No. Ore Cert.	33⅝- 35⅞	Westing. Elec...	53 - 55⅝

Dividends

The Allis-Chalmers Mfg. Company, quarterly, 1¾ per cent on the preferred, and ¾ per cent on account of accumulated dividends, both payable July 16.

The American Can Company, quarterly, 1¾ per cent on the preferred, and 1¾ per cent on account of accumulated dividends, both payable July 2.

The American Steel Foundries, quarterly, 1¼ per cent, payable June 30.

The Bethlehem Steel Company, quarterly, 1¾ per cent on the preferred, payable July 2.

The Canadian General Electric Company, quarterly, 2 per cent on the common, payable July 2.

The Colt's Patent Fire Arms Mfg. Company, quarterly, 4%, payable July 1.

The Ingersoll-Rand Company, quarterly, 3 per cent on the preferred, payable July 1.

The Wheeling Steel & Iron Company, quarterly, 2 per cent and extra 1 per cent, both payable June 30.

The Empire Iron & Steel Company, regular semi-annual, 3 per cent on the preferred and extra 3 per cent on account of accumulated dividends, both payable July 1.

Another of the steel plants in prospect is located at Baltimore, with expectation of using rolled plates and shapes in shipbuilding at perhaps Newport News or Norfolk. Bernard M. Baker, formerly head of the United States Shipping Board, 817 Fidelity Building, Baltimore, is mentioned prominently. A site of 1800 acres on the Patapsco River is under consideration. Emory M. Newton, Gorton P. Paine and Emlin F. Littell are also interested.

EXTRA DIVIDEND DECLARED

Steel Corporation Enables Stockholders to Subscribe to the Red Cross

At a meeting of the board of directors of the United States Steel Corporation in New York on Tuesday afternoon, it was decided to declare another extra dividend of 3 per cent on the common stock, in addition to the regularly quarterly disbursements of 1¾ per cent on the preferred and 1¼ per cent on the common. Another extra dividend of 1 per cent, payable July 28, was also declared, and will go to stockholders with the suggestion that it be contributed to the American Red Cross in the campaign soon to be started for a $100,000,000 fund.

Judge Gary, chairman of the board, also announced that the Steel Corporation would subscribe for $25,000,000 more Liberty bonds, making a total of $50,000,000. "And we may make a still further subscription," he said, "if it should seem necessary to dispose of the total amount of bonds to be placed by the Government within the period ending next Friday."

Total dividend disbursements of the Steel Corporation for the current quarter will amount to $32,990,800, the largest in the history of the corporation. The distribution will be as follows:

Regular for the quarter:	
Preferred, 1¾ per cent.....	$6,304,919
Common, 1¼ per cent.....	6,353,781
Extra dividends:	
Common, 3 per cent.....	$15,249,075
Common, 1 per cent (Red Cross)	5,083,025
Total	$32,990,800

Earnings of the corporation in the first quarter of 1917 totaled $113,121,018, which set a new record. Recent forecasts have set the figure for the current three months about $15,000,000 higher, although this is susceptible to downward revision owing to the fact that the corporation has accepted Government business at considerably less than open market prices.

In addition to such generous dividends as this quarter will show, the corporation has been able to raise the wages of its workers four times within the past year and to appropriate large sums for improvement and expansion of plants, an announcement just having been made that $11,000,000 will be expended on the Fairfield district in Alabama.

In announcing the extra dividend for the benefit of the Red Cross, Judge Gary made this statement:

"The board of directors at a special meeting to-day declared an extra dividend of 1 per cent on the common stock, payable July 28. The dividend was declared in response to the request of many stockholders to declare an extra dividend to enable them to contribute to the large fund which it is sought to obtain for Red Cross purposes, under the auspices of the American National Red Cross.

"The dividend checks will be sent to stockholders with a statement of the circumstances which influenced the action of the board and the disposition of the dividend will be left entirely with the stockholders in accordance with their interests and patriotic instincts."

The Steel Corporation dividend for the benefit of the Red Cross amounts to more than 5 per cent of the total sum which is expected to be raised, but, of course, it is optional with stockholders to contribute to the Red Cross or not.

Recent issues of *Stahl und Eisen* contain articles on beams and girders which review all existing standards, British and American included, according to the London *Iron and Coal Trades Review*. The Germans are apparently about to introduce a series of new shapes in order to compete more effectively in weights per foot in relation to strength.

The O. K. Clutch & Machine Company of Lancaster, Pa., is about to begin building on land at Florence Street and Mill Road, Lancaster. Plans are to complete the new plant by early fall.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver, pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars 83.6c., minimum carload, 36,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 50,000 lb.; structural steel and steel bars 80c., minimum carload, 40,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Plates.—Tank plates, ¼ in. thick, 6 in. up to 100 in. wide, 7c. to 8c. base, net cash, 30 days, or ½ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras

	Cents per lb.
Tank steel	Base
Pressing steel (not flange steel for boilers)	.10
Boiler and flange steel plates	.15
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Locomotive firebox steel	.50

Marine steel, special extras and prices on application.

Gage Extras

Rectangular, ¼ in. thick, over 6 in. wide to 100 in. wide.	Base
Lighter than ¼ in., to 3/16 in., up to 72 in. wide	.10
*Lighter than ¼ in., including 3/16 in., over 72 in. to 84	.20
*Lighter than ¼ in., including 3/16 in., over 84 in. to 96	.30
*Lighter than ¼ in., including 3/16 in., over 96 in. to 100	.40
*Lighter than ¼ in., including 3/16 in., over 100 in. to 102	.45
Lighter than 3/16 in., including No. 8, up to 72 in. wide	.15
*Lighter than 3/16 in., including No. 8, over 72 in. to 84	.25
*Lighter than 3/16 in., including No. 8, over 84 in. to 96	.35
Lighter than No. 8, including No. 10, up to 60 in. wide	.30
Lighter than No. 8, including No. 10, over 60 in. to 64	.35

Up to 72 in. and not less than 10.2 lb. per sq. ft. will be considered ¼ in.
Over 72 in. must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of 3/16 in., take price of 3/16 in.
Over 72 in., ordered weight 3/16 in., take No. 8 price.
Over 72 in., ordered weight No. 8, take No. 10 price.

Width Extras

Over 100 in. to 110 in. inclusive	.05
Over 110 in. to 115 in. inclusive	.10
Over 115 in. to 120 in. inclusive	.15
Over 120 in. to 125 in. inclusive	.25
Over 125 in. to 130 in. inclusive	.50
Over 130 in.	1.00

Length Extras

Universal plates 80 ft. long up to 90 ft. long	.05
Universal plates 90 ft. long up to 100 ft. long	.10
Universal plates 100 ft. long up to 110 ft. long	.20

Cutting Extras

No charge for rectangular plates to lengths 3 ft. and over.

Lengths under 3 ft. to 2 ft. inclusive	.25
Lengths under 2 ft. to 1 ft. inclusive	.50
Lengths under 1 ft.	1.55
Circles 3 ft. in diameter to 100 in.	.30
Circles over 100 to 110 in. (width extra)	.35
Circles over 110 to 115 in. (width extra)	.40
Circles over 115 to 120 in. (width extra)	.45
Circles over 120 to 125 in. (width extra)	.55
Circles over 125 to 130 in. (width extra)	.80
Circles over 130 in. (width extra)	1.30
Circles under 3 ft., to 2 ft., inclusive	.55
Circles under 2 ft., to 1 ft., inclusive	.80
Circles under 1 ft.	1.85
Half circles take circle extras.	
Sketches not over four straight cuts, inc. straight taper	.10
Sketches having more than four straight cuts	.20
Plates sheared to a radius take complete circle extras.	

*Including extra for width.

Wire Rods.—Including chain rods, $90 to $95.

Wire Products.—Prices to jobbers, effective April 20: Fence wire Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $3.45; galvanized, $4.15. Galvanized barb wire and staples, $4.35; painted, $3.65. Wire nails, $3.50. Galvanized nails, 1 in. and longer, $2.20 advance over base price; shorter than 1 in., $2.70 advance over base price. Cement coated nails, $3.40. Woven wire fencing, 48 per cent off list for carloads, 47 off for 1000-rod lots, 46 off for less than 1000-rod lots.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburg basing card in effect from May 1, 1917, all full weight:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	30	3
½	46	31½	⅜	31	4
¾ to 3	49	35½	½	35	17
			¾ to 1½	38	22

Lap Weld

2	42	29½	1¼	23	8
2½ to 6	45	32½	1½	30	16
7 to 12	42	28½	2	31	17
13 and 14	32½	..	2½ to 4	33	20
15	30	..	4½ to 6	33	20
			7 to 12	32	19

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	29	12
½	43	30½	½	34	21
¾ to 1½	47	34½	¾ to 1½	38	23
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	1¼	24	9
2½ to 4	43	31½	1½	30	16
4½ to 6	42	30½	2	32	19
7 to 8	38	24½	2½ to 4	34	22
9 to 12	33	19½	4½ to 6	33	21
			7 to 8	27	15
			9 to 12	22	10

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes.—Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	7.00 to 7.25
Nos. 9 and 10	7.25 to 7.50
Nos. 11 and 12	7.50 to 7.75
Nos. 13 and 14	7.75 to 8.00
Nos. 15 and 16	8.00 to 8.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	7.30 to 7.80
Nos. 22 and 24	7.35 to 7.85
Nos. 25 and 26	7.40 to 7.90
No. 27	7.45 to 7.95
No. 28	7.50 to 8.00
No. 29	7.55 to 8.05
No. 30	7.65 to 8.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	8.50 to 9.00
Nos. 12 and 14	8.60 to 9.10
Nos. 15 and 16	8.75 to 9.25
Nos. 17 to 21	8.90 to 9.40
Nos. 22 and 24	9.05 to 9.55
Nos. 25 and 26	9.20 to 9.70
No. 27	9.35 to 9.85
No. 28	9.50 to 10.00
No. 29	9.75 to 10.25
No. 30	10.00 to 10.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.30 to 7.80
Nos. 17 to 21	7.35 to 7.85
Nos. 22 to 24	7.40 to 7.90
Nos. 25 to 27	7.45 to 7.95
No. 28	7.50 to 8.00
No. 29	7.55 to 8.05
No. 30	7.55 to 8.05
Nos. 30½ and 31	7.60 to 8.10

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
June	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
6	32.50	32.50	60.50	11.50	11.50	9.75	9.50
7	32.50	32.50	61.00	11.50	11.50	9.75	9.50
8	32.50	32.50	61.00	11.75	11.75	9.75	9.50
9	32.50	32.50	....	12.00	11.87½	9.75	9.50
11	32.50	32.50	60.75	12.00	11.87½	9.75	9.50
12	32.50	32.50	60.62½	12.00	11.87½	9.75	9.50

NEW YORK, June 13, 1917.

All the metals are dull and generally inactive, so far as actual transactions are concerned. Copper maintains its strength, futures growing firmer. Tin is inactive but steady. Lead continues to grow stronger and to advance in price. Spelter is extremely inactive but quotations are unchanged. Antimony continues to decline.

New York

Copper.—A quiet business is constantly being done but the volume is not large. In spite of this the market grows firmer every day, especially so far as future positions are concerned, but as a whole it has practically come to a halt because of the uncertainty which has continued so long and still continues as to the amount of copper needed by the belligerents and our own Government and the price to be paid. Yesterday the quotation for both Lake and electrolytic for early delivery was unchanged at 32.50c., New York, but in some cases spot metal was quoted as high as 33c. to 34c. Supplies desired this side of August are obtainable almost entirely only through second hands and the amount available through the rest of the third quarter from the principal producers is not large. The quotation for third quarter ranges from 30.50c. to 31.50c., with the last quarter quoted at 29c. to 29.50c., New York. The London price yesterday for spot electrolytic is still unchanged at £142.

Tin.—Interest centers in the arrangements which are being made between this Government and that of Great Britain to insure adequate supplies of tin for this country. A committee is being formed consisting of importers and consumers and if the personnel and arrangements of this committee satisfy the Government, the matter of the regulation of these supplies will be left practically to the trade which is generally considered satisfactory. It is believed both parties will get together. The Government is mainly interested to see that all tin imports are properly apportioned and that none are hoarded. This matter, together with the duty question, has put a check on business and the entire week has been quiet, with price fluctuations within a narrow range. Yesterday the quotation was 60.62½c., New York, the range in the last week having not exceeded 1c. per lb. There was a moderate business done late last week in future shipments from the East and there has been more interest manifested in far off tin even at present high prices, but not much business has resulted. Arrivals up to and including June 12 were 540 tons, with the quantity afloat 3356 tons. The London market is about £3 lower for spot Straits than it was last week, with a quotation yesterday of £236 5s.

Lead.—The market is quieter but very strong and prices have advanced. Not only have they gone up in the outside market to 12c., New York, and 11.87½c., St. Louis, but the American Smelting & Refining Company advanced its prices twice in the last week, on June 6 to 10.50c. and on June 8 to 11c., New York. There are fewer resale lots appearing and in general buyers do not come into the market to fill their necessary wants, but are proceeding slowly because supplies are in general short and they desire to avoid bidding the market up on themselves. At a meeting in Washington on Monday it is believed that the Government's needs for July and beyond were taken care of but neither the quantity nor the price are known.

Spelter.—Metal for future delivery continues higher than that for nearby and is still quoted at 9.50c., St Louis, or 9.75c., New York, with nearby positions unchanged at 9.37½c., St. Louis, or 9.62½c., New York. The market is dead but firm at these prices. Uncertainty as to the Washington situation is the controlling factor. Inquiry, as a result of Government orders, has appeared in the last few days, especially from brass makers, but there appears to be not a little confusion as a result of misunderstandings. One large purchase was put through and then the buyer learned that the Government would furnish the spelter and he had to sell again. Other cases of a similar nature are reported, one for a foreign government, due to the confusion at Washington and the misunderstanding resulting. The situation is not satisfactory and keeps the market unsettled.

Antimony.—The market for spot and nearby metal has further receded and Chinese and Japanese grades are obtainable at 20c. to 21c., New York, duty paid. The demand is small except for futures.

Aluminum.—Quietness prevails with demand for early delivery small. No. 1 virgin metal, 98 to 99 per cent pure, is unchanged at 59c. to 61c., New York.

Old Metals.—The market is quiet with the exception of lead, which is very active. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	31.00 to 31.50
Copper, heavy and wire	29.50 to 30.00
Copper, light and bottoms	27.50 to 28.00
Brass, heavy	20.75 to 21.25
Brass, light	15.75 to 16.25
Heavy machine composition	27.00 to 27.25
No. 1 yellow rod brass turnings	19.50
No. 1 red brass or composition turnings	21.50 to 22.50
Lead, heavy	10.25 to 10.75
Lead, tea	9.25
Zinc	7.50

Chicago

JUNE 11.—The metal market is quiet but firm. Copper cannot be called active. Lead is exceedingly strong because of the acute scarcity; supplies being so meagre that trading is restricted. Antimony is lacking in interest and again shows a decline. Spelter continues to drift. We quote as follows: Casting copper, 31c; Lake, 32c.; electrolytic, 32.75c. to 33c.; tin, carloads, 61.25c.; small lots, 64c. to 65c.; lead, 12c. to 12.50c.; spelter, 9.50c.; sheet zinc, 19c.; Oriental antimony, 24c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 27c.; copper clips, 26.50c.; copper bottoms, 24.5c.; red brass, 24c.; yellow brass, 18c.; lead pipe, 8.75c.; zinc, 6.50c.; pewter, No. 1, 35c.; tinfoil, 42.50c.; block tin, 47.50c.

St. Louis

JUNE 11.—Metals have been rather quiet in this market, though they have readily responded to the influences of other markets in the matter of prices. At the close to-day, in carload lots, lead was quoted strong at 12c. and spelter quiet but firm at 9.50c. In less than carload lots, metal prices were: Lead, 12.50c.; spelter, 10.50c.; tin, 68c.; Lake copper, 33.50c.; electrolytic copper, 33c.; Asiatic antimony, 25c. In the Joplin district, lead ore was sharply higher, advancing to $120 per ton, basis of 80 per cent metal, with an average price for the week for the district of $129. Zinc blende was firm on a range of $70 to $80 per ton, basis of 60 per cent metal, with an average for the week for the district of $76 per ton. Calamine was firm at $38 to $45 per ton, basis of 40 per cent metal, and an average for the week for the district of $41 per ton. Production of blende is much larger than a year ago, but the increased demand appears to be taking care of the output, though it is not advancing in price at present. No surplus is piling up in the district bins. Some producers of lead ore are holding their output for still further advances. On miscellaneous scrap metals, we quote dealers' buying prices as follows: Light brass, 12c.; heavy yellow brass, 13c.; heavy red brass and light copper, 19c.; heavy copper and copper wire, 22.50c.; pewter, 25c.; tinfoil, 40c.; zinc, 6.50c.; lead, 6c.; tea lead, 3.50c.

PERSONAL

Alvan T. Simonds has resigned the presidency of the Simonds Mfg. Company, Fitchburg, Mass., to accept an appointment as a captain in the Ordnance Reserve Corps. The appointment is for the duration of the war and Mr. Simonds is making the sacrifice to accept the appointment because he has had an experience particularly fitting him to assist in the purchase and production of steel helmets and thin armor plate for artillery carriages, armored locomotives and tractors. His company has for several years been producing thin armor plate for the United States Government and is now making bullet-proof shields in large quantities for the Russian government. It is probably the only concern in the United States equipped to fabricate steel helmets and thin armor plate complete in its own plants. Only three concerns in the United States, it is stated, have been successful in meeting the severe specifications of this quality of material.

A. T. SIMONDS

Dr. William O'Neil Sherman, chief surgeon of the Carnegie Steel Company, Pittsburgh, recently conducted a clinic in the West Penn Hospital, that city, to show the application of the Carrel treatment, the most successful disinfectant and healing agent yet used on the battle front in Europe.

L. E. Barr, secretary of the McJunkin Machine Company, Wheeling, W. Va., will have charge of a new supply store recently opened by the McJunkin Company in Winchester, Ky.

J. Rogers Flannery of Pittsburgh, chairman of the Pittsburgh Chapter, American Red Cross, has been called to Washington, D. C., to help Henry P. Davison of J. P. Morgan & Company to get the American Red Cross upon a basis of higher efficiency. Mr. Flannery is a large manufacturer in Pittsburgh, being president of the American Vanadium Company, the American Flexible Boat Company, and actively connected with other manufacturing interests.

John O. Pew, formerly president of the Youngstown Iron & Steel Company, Youngstown, Ohio, taken over some months ago by the Sharon Steel Hoop Company, Sharon, Pa., has purchased the 1066-acre farm of Dan R. Hanna, near Ravenna, Ohio. His son, William H. Pew, professor of animal husbandry in the Iowa Agricultural College, will manage the tract. Mr. Pew intends to raise live stock.

Marshall Williams, formerly operating manager of the Pittsburgh division plants of the American Bridge Company, has been appointed assistant to August Ziesing, president, and will perform his new duties with headquarters in Pittsburgh. George M. Hunter, formerly manager of the Gary plant of the American Bridge Company, Gary, Ind., succeeds Mr. Williams. P. W. Seil succeeds Mr. Hunter as manager of the Gary works.

Edward Beard has been appointed chief electrician of the Haselton blast furnaces, also the open-hearth steel works and by-product coke plant of the Republic Iron & Steel Company at Youngstown, Ohio. George Mohr has been named his assistant. Henry Fusselman has been appointed chief draftsman of the electrical department of the Republic Company in the Youngstown district.

Ainslie Gray and Charles Benjamin have formed the firm of Gray & Benjamin, with offices at 301-302 Transportation Building, Chicago, and will act as advertising counsel to manufacturers of electrical, mechanical, chemical and kindred products. Mr. Gray was formerly managing editor of the *Electrical Review and Western Electrician*. Mr. Benjamin was the first editor of *Printers' Ink* and from 1906 to 1915 was advertising manager of the Cutler-Hammer Mfg. Company, Milwaukee.

The Vogt Bros. Mfg. Company, Louisville, Ky., which is building new machine and foundry shops at Sixteenth and Rowan streets, Louisville, has elected Archer M. Rice secretary and office manager. Mr. Rice, who formerly was efficiency manager for the Henry Vogt Machine Company, Louisville, succeeds E. L. Vogt, who had been secretary-treasurer, and retains the title of treasurer. The change was made in connection with filing of an amendment to the charter increasing the capital from $50,000 to $250,000.

Lawrence W. Wallace, instructor of railway and industrial management at Purdue University, Lafayette, Ind., has obtained a year's leave of absence in order to accept an offer of the Diamond Chain & Mfg. Company, Indianapolis, which is building a large modern plant and reorganizing on a scientific basis, in which work he will assist.

H. P. Bope, vice-president and general manager of sales, Carnegie Steel Company, was on the program of the World's Salesmanship Congress at Detroit, Monday, June 11, for a paper on "Selling and Distribution in Steel Construction." Frank Baackes, vice-president and sales manager, American Steel & Wire Company, Chicago, was scheduled to lead in the discussion of this subject.

Charles Oliver, in charge of sales of the Oliver Iron & Steel Company, Pittsburgh, has enrolled with the Officers' Reserve Corps and is located at the training camp at Fort Niagara, N. Y.

F. M. Wicks, manager of the Milwaukee works of the Westinghouse Lamp Company, has accepted the invitation of the Industrial Commission of Wisconsin to serve as chairman of a special committee of experts to draft minimum standards for both natural and artificial illumination in industrial plants for the purposes of the revised shop lighting code to be issued by the commission. Other members of the committee include: Richard Finn, Cutler-Hammer Mfg. Company; George F. Rohn, electrical engineer, and H. G. Monger, Milwaukee Electric Railway & Light Company, all of Milwaukee.

Louis Rasmussen, superintendent Wisconsin Aluminum Foundry Company, Manitowoc, Wis., resigned June 1 to accept a position at Marshalltown, Iowa. Officers and employees tendered him a banquet.

J. S. Fraser, superintendent of blast furnaces for the Pittsburgh Steel Company, has been promoted to superintendent of furnaces and steel works. H. R. Shick, assistant furnace superintendent, has been appointed blast furnace superintendent.

Edwin E. Arnold, chief engineer of the New Departure Mfg. Company, Bristol, Conn., has resigned to become vice-president and general manager of the Iron City Products Company, Pittsburgh, Pa.

Oscar U. Cook, formerly chief inspector of the Carnegie Steel Company in the Youngstown, Ohio, district, has resigned to accept a similar position with the Tennessee Coal, Iron & Railroad Company at Birmingham, Ala. He was presented a traveling bag and toilet set by officials and employees of the Ohio Works of the Carnegie Company.

W. G. Costin, president of the Pittsburgh Screw & Bolt Company, has returned to Pittsburgh after a six months' trip to Florida and other places, taken to build up his health, which has very much improved. He expects to resume active business shortly.

Ralph E. Graves, formerly Pittsburgh representative of the Cleveland Punch & Shear Works Company, Cleveland, has been placed in charge of a new office opened by that concern in room 1928, McCormick Building, Chicago, and will have charge of the Middle Western territory. T. J. McNamara succeeds Mr. Graves as manager of the Pittsburgh office.

Joseph F. Guffey, Pittsburgh, as president of the Natural Gas Association of America, is a member of the recently organized National Committee on Gas and Electric Service, which has been recognized by the

Advisory Commission of the Council of National Defense as one of its advisory committees. Headquarters have been established for this committee in the Munsey Building, Washington, D. C., with George W. Elliott, secretary.

W. W. Hall, who resigned some months ago as Pittsburgh sales manager of the Republic Iron & Steel Company to go with the Columbia Steel & Shafting Company, Pittsburgh, has been made assistant general manager of that company.

A. W. Lyle, formerly with the Jones & Laughlin Steel Company, Pittsburgh, has been appointed superintendent of the rod and blooming mills of the Keystone Steel & Wire Company, Peoria, Ill.

Frank A. Burr, who last year succeeded A. J. Moxham as president of the Aetna Explosives Company, has withdrawn from the company. Its affairs are now being managed by receivers.

Albert C. Taylor, for a number of years with the Bethlehem Steel Company, has been appointed secretary of the Eastern Bar Iron Institute, which was recently organized under the Eddy open-price competition system and has located headquarters at Room 613, Terminal Building, 103 Park Avenue, New York.

P. H. Reardon has retired as president of the General Machinery & Supply Company, 39-51 Stevenson Street, San Francisco, and has opened an office at 57 First Street, San Francisco, to specialize in compressed air and general machinery.

C. A. Newman, formerly manager of sales promotion for Henion & Hubbell, Chicago, wholesalers in power pumps, mining and mill supplies, has been made sales manager of the Boiler-Kote Company, with general sales offices in the Fisher Building, Chicago.

Arthur M. Torrey, formerly with W. S. Barstow & Co., Inc., has entered the employ of Hildreth & Co., inspection engineers, 15 Broad Street, New York, with which firm he was connected for several years prior to joining the Barstow force.

F. William Richards of New York has become manager of the Columbia Malleable Castings Company, Columbia, Pa. L. R. Zifferer, the vice-president, is expected to divide his time hereafter between the Columbia plant and the company's New York office.

New Cost Accounting Division

WASHINGTON, June 12, 1917.—For the purpose of assisting the Government in the placing of contracts on a cost plus profit basis the Bureau of Foreign and Domestic Commerce of the Department of Commerce has taken over the cost accounting work initiated by the Federal Trade Commission and has organized a new division which will probably be brought into close relations with the projected International Purchasing Commission, the plans of which are being worked out by the Treasury Department. Although the first task of the new division will be to co-operate with the Government in the making of war contracts and in auditing accounts thereunder, it will be a permanent institution with the ultimate object of establishing uniform systems of cost accounting in the different industries of the country. J. Lee Nicholson, head of a well-known accountancy firm in New York, has been appointed chief of the new division.

Large Orders for Locomotives

In the past two weeks orders for 650 locomotives have been reported. An order from the Russian Government for 500 decapod locomotives has been equally divided between the American Locomotive Company and the Baldwin Locomotive Works. The American Locomotive Company will also furnish the Southern Railway with 25 Sante Fes and the South African Railways with 20 Mountain type locomotives, as well as 68 additional decapod locomotives for the Russian Government. The Pennsylvania Lines West is having 30 locomotives built at the company's Altoona shops. It is estimated that locomotives ordered in May were 1276, the largest for any month this year, bringing the total to June 1 to 3013. About one-third of these are for export. In 1916 the total orders were 5750, so that the rate thus far this year exceeds that of last year.

OBITUARY

WILLIAM A. STEVENSON, general manager of the Norwood Engineering Company, Florence, Mass., was found dead in his bed at his home, June 7. Death was due to heart failure. He was also general manager of the Norwood Engineering Company of Canada, which is now making munitions for the British Government. Mr. Stevenson was born in Franklin, Vt., July 16, 1860, and when a young man was employed in railroad work. From 1890 to 1893 he was a salesman for the Kelsey-Fitch Signal Company, Northampton, Mass. When the Norwood Engineering Company was organized in 1893 Mr. Stevenson was made general manager. The company manufactures paper-making machinery, water filters, fire hydrants and special machinery of various kinds. Mr. Stevenson was a member of the Engineers' Club of New York.

RALPH S. GREENLEE, SR., aged 79, died at his home in Chicago, June 11. Mr. Greenlee, with his brother, the late Robert L. Greenlee, founded the Northwestern Foundry Company, the Greenlee Foundry Company, the Northwestern Stove Repair Company and Greenlee Brothers & Company, machine manufacturers, at Rockford, Ill. Mr. Greenlee was born on a farm near Conneautville, Pa. He went to Chicago in 1863. He was a member of the Union League Club for nearly 30 years.

W. W. GREEN, president of the Garden City Fan Company, Niles, Mich., died at his home in that city June 2. Mr. Green was born in Williamstown, Mass., Dec. 9, 1838. In 1872 he moved to Chicago, where he remained until 1902, when as president of the Garden City Fan Company he moved to Niles in order to devote greater time to the company's manufacturing plant, which had been built there. He continued his residence at Niles until his death.

JOHN C. BRIDGMAN, general manager of the Hazard Mfg. Company, Wilkes-Barre, Pa., died suddenly at his home, May 28. He was born at Northampton, Mass., 55 years ago and about 30 years ago went to Wilkes-Barre as one of the principals of the Harry Hillman Academy. In 1888 he became sales agent for the Hazard Mfg. Company and later secretary. About 20 years ago he was made general manager.

OLIVER S. HUTCHINSON, vice-president and secretary of the Euclid Crane & Hoist Company, Euclid, Ohio, was drowned in Vermillion River, Canada, May 24. He was a native of Cleveland and 39 years of age. Before his connection with the Euclid Crane & Hoist Company, he was associated with the Cleveland Crane & Engineering Company, Wickliffe, Ohio, and the Browning Engineering Company, Cleveland.

WILLIAM C. BROHM, vice-president and general manager of Grainger & Company, Louisville, Ky., died June 6 at his home in Louisville after a long illness. He was 45 years of age and had been connected with Grainger & Company for 20 years.

Furnace Coke and Basic Pig Iron Buying

PITTSBURGH, June 13.—(*By wire.*)—A contract for about 12,000 tons of furnace coke per month for a Valley furnace has been made at $9.50 per net ton at ovens for last half of this year.

A large consumer in the Wheeling, W. Va., district has bought 15,000 to 20,000 tons of basic for first half of next year and is said to have paid about $50 per ton, Valley furnace.

The William Cramp & Sons' Ship & Engine Building Company has increased the size of its shipyard at Philadelphia by taking title from the Kensington shipyard to the latter's plant on the southeast side of Beach Street, above Palmer, and by taking title to the plant of the I. P. Morris Company, occupying a plot 309 ft. front by an irregular depth at Richmond and York streets.

WAR REVENUE BILL

Senate Committee Making Progress Slowly in Final Revision

WASHINGTON, June 12, 1917.—The Senate Finance Committee yesterday began the task of formally approving the tentative action heretofore taken with regard to the various provisions of the war revenue bill and of finally determining several important points not heretofore voted upon. This task will occupy the committee during the remainder of the present week and the bill will hardly reach the Senate before Saturday and possibly not until Monday or Tuesday of next week. Opposition to many features of the bill which developed last week has delayed the work of the committee and prevented the report which Chairman Simmons had planned to make to the Senate yesterday.

The work of finally revising the revenue bill has progressed only as far as the income tax provisions. The committee formally adopted the normal tax on incomes of 4 per cent as fixed by the House bill, but rejected the increased surtaxes on incomes above $40,000 embraced in the so-called Lenroot House amendment. The retroactive taxes on incomes for 1916 were stricken out and an exemption was agreed upon for corporations' dividends received from other corporations subject to income tax. In this connection the tentative action heretofore taken repealing the present special tax of 12½ per cent upon war munitions was approved on the ground that munitions manufacturers will be called upon to pay their full share in the proposed increased income and excess profits taxes.

The excess profits tax was debated by the Finance Committee this afternoon and it was decided to increase the House rate. Opinion appeared to center on 20 per cent as the proper rate of tax but this item is likely to be one of the last to be finally determined.

Chairman Simmons expresses the opinion that the Senate will devote two or three weeks to the discussion of the bill and that an additional week will be required for the conference committee to harmonize the diverse features of the House and Senate drafts. Final passage of the measure, therefore, can hardly be looked for under three or four weeks after the measure has been formally presented in the Senate.

Lackawanna Employees and Liberty Bonds

The showing made by the employees of the Lackawanna Steel Company in their subscription for Liberty bonds is worthy of note. Up to Monday 3960 out of a total of 10,000 employees had made subscriptions for bonds to the face value of $382,250. The employees of the subsidiary Ellsworth Collieries Company in Washington County, Pa., who are largely foreign born, made an especially good response. Out of 1850 such employees 1353 subscribed for a total of $102,800. Other subscriptions at all the company's plants are yet to be heard from.

Pickands, Mather & Company, Cleveland, have placed a subscription for $2,800,000 worth of Liberty bonds. These will be distributed among members of the firm, its employees, and the blast furnace and mining companies controlled by the firm. Other Cleveland Liberty bond subscriptions reported this week include the following: Lakewood Engineering Company, $150,000; Electric Controller & Mfg. Company, $100,000; Lamson & Session Company, $107,100; Foster Bolt & Nut Company, $63,350; Grabler Mfg. Company, $58,000; Interstate Foundry Company, $50,000; Champion Rivet Company, $50,000; employees of the Standard Tool Company, $42,000; National Screw & Tack Company, $40,000; Johnson & Jennings Company, $30,000; and the Park Drop Forge Company, $20,000.

The Wheeling Steel & Iron Company, Wheeling, W. Va., has declared a quarterly dividend of 2 per cent and an extra dividend of 1 per cent payable June 30.

Pittsburgh and Nearby Districts

The Columbia Steel & Shafting Company, Pittsburgh, maker of turned and polished shafting and cold-drawn screw stock, has opened an office in room 338 Munsey Building, Washington, D. C., in charge of Joseph T. Somers as special representative. Mr. Somers is district manager of sales of the Philadelphia office of the Columbia Steel & Shafting Company, but will spend most of his time at the Washington office in the interest of Government business.

The Brier Hill Steel Company, Youngstown, Ohio, has awarded a contract to Stone & Webster for the foundation for its new blast furnace and plate mills, and work has already started.

A. M. Byers Company, Inc., of Pittsburgh, operating a plant at Girard, Ohio, containing 88 puddling furnaces, has closed it, the company refusing to sign the Amalgamated Association scale for boiling. This plant has been operating non-union for some years, but the company has always paid the Amalgamated scale for puddling and several times a higher wage rate. The Amalgamated Association is trying to form a lodge among the puddlers, and when this became known the company promptly closed the plant. There is also a plate mill in connection with the puddling plant, but this is still in operation.

The Brier Hill Steel Company and Youngstown Sheet & Tube Company, both of Youngstown, Ohio, are in the market for a large number of electric cranes, also plate mill equipment for the two plate mills to be built by the Brier Hill Steel Company, and the 84-in. tandem plate mill to be built by the Youngstown Sheet & Tube Company.

The regular monthly meeting of the Pittsburgh Association of Iron and Steel Electrical Engineers will be held in that city on Saturday, June 16. James Farrington will present a paper on "By-Product Coke Ovens in the Steel Industry."

The question of insuring the Government an adequate supply of tubular iron and steel products has been placed in the hands of a committee of steel makers of which J. A. Campbell, president of the Youngstown Sheet & Tube Company, Youngstown, Ohio, is chairman.

The Driggs-Seabury Ordnance Corporation, Sharon, Pa., has been taken over by the Savage Arms Company, and will hereafter operate under that name. Large additions are to be made to the works at Sharon, including the doubling of the capacity of the forge department, and a large office building is also to be erected.

It is expected that in about 60 days the first of the nine new bar and small shape mills being erected by the Carnegie Steel Company at McDonald, west of Youngstown, Ohio, will be finished and ready for operation.

To Make Special Study of Refractory Materials

With a view to stimulating scientific research work in the manufacture of fire brick and clay products a fellowship in the Mellon Institute of Industrial Research has been endowed by the Refractories Manufacturers' Association, made up of manufacturers of fire brick, silica, chrome and magnesite brick. The industrial fellowship system at the Mellon Institute, which is operated in connection with the University of Pittsburgh, as a means of applying science to industrial problems, has been followed for six years. Associations, companies and individuals have an opportunity to found fellowships for investigations peculiar to their own industry.

The Refractories Manufacturers' Association has an office at 220 South Michigan Avenue, Chicago. Porter S. Kier, Kier Fire Brick Company, Pittsburgh, is president; E. M. Allen, American Refractories Company, Chicago, is vice-president; J. H. Cavender, Chicago Retort & Fire Brick Company, is treasurer, and Frederic W. Donahoe is secretary.

SCHWAB URGES BOND BUYING

Bethlehem Steel Company Starts Campaign—Many Other Companies Are Active

The Bethlehem Steel Company inaugurated a campaign June 4 among employees at its different plants to raise a subscription of $2,000,000 for the Liberty bonds. The plan adopted by the company allows the men one year to pay for their subscriptions, dating from June 15, at the rate of $1 a week on a $50 bond; $2 a week on a $100 bond; $10 a week on a $500 bond, and $20 a week on a $1,000 bond. The results of the first day's campaign at South Bethlehem works with about 30,000 employees totaled $724,650, and the second day $1,382,700. The total for all of the plants for the two days aggregated $2,604,600. The campaign for the sale of Liberty bonds was launched at South Bethlehem with a speech by Charles M. Schwab and other prominent speakers, who addressed the 1500 captains and lieutenants of the teams organized for a canvass of the works.

At a recent meeting of the board of directors of the Vanadium-Alloys Steel Co., Latrobe, Pa., the purchase of $100,000 Liberty bonds was authorized, and in addition to this amount the company will also purchase all the Liberty bonds subscribed for by employees, allowing payment on easy terms covering a period of approximately one year. No interest charge will be made and upon final payment the bonds will be delivered to the employees with all coupons attached.

The Studebaker Corporation, South Bend, has subscribed for $1,000,000 of Liberty bonds, one-half of which may be taken by employees.

United Engineering & Foundry Company, Pittsburgh, has subscribed for $100,000 worth of Liberty bonds and also for $150,000 of bonds for its employees. It is optional with the employee whether he buy a bond or not. To those who are paid bi-monthly 5 per cent of their subscription will be deducted each pay and 10 per cent from the pay of those who get their checks once a month. Interest at the rate of 3½ per cent is paid proportionately, according to the amount paid in by the subscriber. Provision is also made if an employee should die during the payment of his subscription, the company will pay up to $50 for a $50 bond, and up to $100 for a $100 subscription, the money to be turned over to the beneficiary. In case a man leaves the company's employ, the contract may be continued or terminated, and he will be properly reimbursed. At first the men will merely sign subscription blanks, indicating their willingness to take the bonds, but later a contract will be made with each one.

E. W. Mudge & Company, Frick Building, Pittsburgh, have subscribed for $300,000 worth of Liberty bonds.

The Shenango Furnace Company, Oliver Building, Pittsburgh, has subscribed for $500,000 worth of Liberty bonds.

The LaBelle Iron Works, Steubenville, Ohio, has subscribed for $1,000,000 worth of Liberty bonds and has taken an additional $200,000 worth, to be distributed among its employees on the monthly payment plan if they desire to invest in the bonds.

June 6 was Liberty loan day at the different plants of the General Electric Company. Employees subscribed a total of over $2,000,000 to the fund, and which amount is in addition to the company's subscription of $5,000,000. The totals at the various plants were as follows: Schenectady works, $1,014,750; Pittsfield, Mass., $282,500; Lynn, Mass., $400,000; Erie, Pa., $175,000; Harrison, N. J., $145,000; Sprague works, Bloomfield, N. J., $53,500; Fort Wayne Electric Works, $148,150; the National Lamp Division, $153,000; district offices, $195,000.

The Standard Parts Company, Cleveland, as a result of an energetic campaign among its employees, has secured subscriptions to the Liberty bonds amounting to over $46,000 from 780 out of its 950 employees and expects to have every employee a subscriber to a bond before the campaign is completed. This company has made an arrangement with a bank by which the employees are given a year to pay for their bonds, which carry themselves, the bank charging the same rate of interest as is paid on the bonds. The first one or two payments on the bonds will be deducted from the men's wages and after that the payments will be made directly to the bank.

The John A. Roebling's Sons Company, Trenton, N. J., has issued notice to employees, printed in red, white and blue, informing them that the company will purchase Liberty bonds for their accounts and deduct a small amount from the wages each week until the face amount of the bond is defrayed.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has bought $25,000 of Liberty bonds and the same amount for its employees, who will be allowed to pay for them in monthly payments.

McKenna Brothers Company, Pittsburgh, subscribed for $100,000 worth of Liberty bonds and also for $6,950 worth for its employees, who will pay for the bonds in 49 equal weekly payments. The bonds will be given to the employees upon expiration of that time, with all the interest coupons attached, so that they will receive considerably more than 3½ per cent interest for the first year, as the company loaned the money to its employees without interest charges.

The Vanadium Alloys Steel Company, Latrobe, Pa., subscribed for $100,000 of Liberty bonds, and also for a considerable amount for its employees, who will be allowed to pay for them in weekly payments, running over nearly a year.

Nut, Bolt and Rivet Makers Organize

A large number of leading makers of nuts, bolts and rivets have organized an association to be conducted on the Eddy plan, and known as the Bolt, Nut and Rivet Institute. The new organization already has 38 members, composed of the larger makers of nuts, bolts and rivets, and the next meeting will be held in the William Penn Hotel, Pittsburgh, June 26, when a large accession to its membership is expected. The new association will not deal with prices or labor conditions, but is formed solely for general betterment of conditions in the nut, bolt and rivet trades, which have not been satisfactory for a long time. Norris J. Clarke, secretary of the Upson Nut Company, Cleveland, is president; W. L. Comly, of the Russell Burdsall & Ward Bolt & Nut Company, Port Chester, N. Y., is vice-president; W. T. Jones of the Foster Bolt & Nut Company, Cleveland, treasurer, and Charles M. Best is secretary. The offices of the Institute are located in rooms 227, 230 Oliver Building, Pittsburgh.

Department of Munitions Proposed

WASHINGTON, June 12, 1917.—The creation of a new executive branch of the Government to be known as the Department of Munitions, the head of which shall be a member of the President's cabinet at a salary of $12,000 per annum, is provided for in a bill introduced in the House by Representative McFadden of Pennsylvania. The new official would have complete control of purchases of all material connected with the national defense.

There is considerable sentiment in Congress in favor of the passage of this measure, but the Administration is understood to oppose it. Obviously, it does not co-ordinate either with the present organization of the Council of National Defense and the general munitions board, or with the plans of the Secretary of the Treasury for the creation of an international purchasing commission. Representative McFadden will urge the bill upon the attention of the House Committee on Military Affairs in the hope of securing a favorable report.

At a recent meeting of directors of the Packard Electric Company, Warren, Ohio, the following officers were named for the coming year: President and treasurer, N. A. Wolcott; vice-president, Charles Fillius; secretary, R. E. Gorton. Mr. Wolcott has been associated with the Packard organization in the position of treasurer for the past 14 years.

Machinery Markets and News of the Works

MARKET CONTINUES QUIET

Ship Interests Begin to Place Orders

Plant Equipment and General Machinery in Demand—Machine Tools Move in Small Lots—Optimistic Prophecies for Future

Shipyard activity is beginning to be the big feature of the machinery market and orders are succeeding the flood of inquiries of the past few weeks. Several large projects that are known to be awaiting the decisions of General Goethals are expected to come into the open at any time and result in orders for ship building equipment in quantities that will be reflected in the sales of all kinds of metal-working machinery. So far the machine tool industry has had but little business that can be traced directly to the ship program, but as projected yards become realities, this condition will change. The engine, motor and boiler plants that are equipped to take a part in the ship program will need to expand considerably to make deliveries in time if the promised deliveries of hulls and completed vessels are rigidly adhered to.

Many new corporations are being organized to enter the motor truck and tractor field and their requirements will lead to increased sales of machine tools. There are distinct signs of largely increased activity in the railroad shops and several of the western roads have come into the market for some of the heavier tools. There are well-founded reports of greater business from car builders and rumors of the organization of another large car-building unit. The builders of electric motors and generators recently have been large purchasers of equipment and it is believed that other large orders will soon come from this source.

The absence of important lists still marks the machine tool market, but most manufacturers are optimistic about the future notwithstanding its many problems. Prices have changed but little, if at all, during the week, and the many small scattered orders that have made up the good volume of business for several weeks past show no signs of lessening. Prices on products in which the raw material is a greater factor than the labor are bounding upward at a fast pace and the advances appear to have no effect upon sales and to be considered but little by purchasers The question of delivery is of so much greater moment that the price is forgotten in the struggle to secure needed equipment—and on machinery most needed deliveries are constantly being put back.

New York

NEW YORK, N. Y., June 11, 1917.

The Government program for steel ship construction continues the center of interest in the machine-tool market. Though many of the inquiries which have been made the past few weeks are waiting upon Government action for the placing of orders, evidences that the steel shipbuilding program is partially under way appeared the past week in the closing of contracts for equipment for shipbuilding plants.

The Terry Shipbuilding Corporation, which has a contract to build 20 steel ships of the composite type, bought a quantity of machine-tools, principally for punching and shearing, and will be in the market for other tools to equip its yard at Savannah, Ga., and a large order for punching and shearing machinery was let by the Baltimore Drydock & Shipbuilding Company, Baltimore, which is also about to place a contract for a considerable number of cranes.

One of the Pacific coast plants, which was organized about a year ago, has come into the market for complete equipment for another plant to build steel ships. The building of submarine chasers has resulted in the purchase of additional machine tools by yacht builders who have received Government contracts.

Aside from these few actual war orders, the inquiries and orders come from scattered sources and are of a miscellaneous character. Machine shops are quite universally adding to their equipment in anticipation of larger business in the near future. Deliveries are still a matter of concern, and the situation appears to be growing worse instead of better in some lines. Cranes are in big demand and deliveries are not promised in less than six months in many instances. Difficulties in obtaining motors complicate the crane situation.

While no actual price advances were announced the past week, a gradual tightening in quotations is taking place and the practice of selling machine-tools at the price prevailing at time of delivery is becoming general. Further advances are virtually certain because of the higher price of pig iron.

The General Electric Company's recent list for the Schenectady works, which has been the subject of comment the past few weeks, has been placed to a large extent, and amounts in all to about $500,000.

Purchases of machine tools by the railroads are few and far between. There is considerable interest in this district in the organization of new companies for the manufacture of motors, motor trucks, airplanes and auxiliary apparatus. It is certain that when such projects culminate in definite construction there will be an additional influx of orders for machine tools of all types.

Export trade in machine tools is heavy. Orders are largely from France and Spain. The latter country has been ordering types of equipment which have formerly been made in France, indicating that France is no longer able to supply some of her old customers.

The work in progress at the plant of the Keuffel & Esser Company, Hoboken, N. J., consists of the erection of two additions, one of five stories on Grand Street and another of four stories on Jefferson Street.

The new plant of Kraeuter & Co., Inc., 583 Eighteenth Avenue, Newark, N. J., manufacturer of tools, will be used for die-sinking work and the manufacture of drop forgings. It will include a one-story, steel frame drop forging department, about 60 x 240 ft., and a second building, 60 x 150 ft. A pickling plant, 60 x 80 ft., and a boiler house will also be constructed. The entire plant is estimated to cost about $160,000 and is expected to be ready for occupancy early in July. Arthur A. Kraeuter is president.

The D. D. F. Nut Lock Company Newark, N. J., has been incorporated with a capital of $125,000 to manufacture nuts, bolts, etc. Louis D. Frenot, Felix P. Jolson and W. Eugene Turton are the incorporators.

The Public Service Electric Company, Terminal Building, Newark, N. J., has plans for the erection of two power plant extensions to its Essex power station, Point-No-Point, to cost $365,000. The additions will be steel and concrete, three stories, 89 x 166 ft., and six stories, 38 x 64 ft. N. A. Carle is chief engineer.

The Ajax Electric & Mfg. Company, Newark, N. J., has been incorporated with a capital of $125,000 to manufacture electrical specialties. Rudolph Bauman, Ruscunn S. Hicks and Walter W. Bluske are the incorporators.

The plants of the Beckton Chemical Company and Cawley, Clarke & Co., Passaic Street, Newark, N. J., have been acquired by the E. I. du Pont de Nemours Company, Wilmington, Del., for a consideration said to be about $2,000,000. The manufacture of chemicals will be continued.

The General Machine Company, Newark, N. J., has been organized to operate a plant for machine construction and repair work at 413 Market Street. Frank J. Muench, 510 South Sixteenth Street, is president.

The Newark Rubber Tire Company, 266 Halsey Street,

Newark, N. J., has increased its capital from $10,000 to $100,000.

The Submarine Boat Corporation, Bayonne, N. J., a subsidiary of the Elco Company, Avenue A, Bayonne, manufacturer of marine engines and motor boats, has made application to the board of works, Newark, N. J., for a lease of about 30 acres at Avenues R and S, giving it the total acquisition of about 113 acres. The company is reported to be planning for the construction of a plant to build submarines and submarine chasers. Henry R. Sutphen is vice-president.

The board of education, City Hall, Bayonne, N. J., will receive bids until 8 p. m., June 21, for manual training tools, etc., for the city schools. James D. Boyd is secretary of the Board.

The Midland Motor Company, 15 Exchange Place, Jersey City, N. J., has been incorporated with a capital of $1,000,000 to manufacture automobiles, motor trucks, and aeroplanes. Arthur W. Britton and Harry B. Davis, 28 Nassau Street, New York, are the incorporators.

The Bridgeman Smith Company, 487 Kent Avenue, Brooklyn, N. Y., is preparing plans for the erection of its new plant at Kingsland, N. J., for the manufacture of paper boxes, etc., at an estimated cost of about $250,000.

The Sholes Typewriter Company, Wilmington, Del., has acquired a section of the plant of the Sanders Metal Process Company, Pierre Avenue, Garfield, N. J., which it will equip for the manufacture of noiseless typewriters. A. F. Mulhara will be in charge.

The Bloomfield Foundry Company, 40 Myrtle Avenue, Bloomfield, N. J., has been organized to operate a brass foundry and machine shop. James J. Clark and Thomas L. Conlong are the proprietors.

The proposed addition to the plant of the Spicer Mfg. Company, 308 West Fourth Street, Plainfield, N. J., will consist of several extensions, it is said, for the increased output of universal joints.

The National Folding Box & Paper Company, 132 Franklin Street, New York, has increased its capital from $1,000,000 to $2,000,000.

The Arnold & Nissen Tool Company, Brooklyn, N. Y., has been incorporated with a capital of $30,000 to manufacture tools. R. L. and A. W. Arnold and C. D. Nissen, 711 Seventh Street, Brooklyn, are the incorporators.

The Paper Working Machines Company, 649-667 Kent Avenue, Brooklyn, N. Y., manufacturer of machinery, has acquired a tract of about five acres at Mill Basin, Jamaica Bay, L. I., with factory building, for an extension to its works.

The Brown-Spin-Wright Company, 61 Broadway, New York, manufacturer of textile and other machinery, has been incorporated with a capital of $700,000. A. C. Proudfit, E. P. Prentice and H. Imbrie are the incorporators.

The Newburgh Shipyards, Inc., recently incorporated in Delaware with a capital of $3,000,000, has acquired the plant of the Newburgh Shipbuilding Company, Newburgh, N. Y., now in process of construction, at an estimated cost of about $250,000. Thomas C. Desmond, associated with the Bush Terminal Company, Brooklyn; John J. Farrell, son of the president of the United States Steel Corporation, South Norwalk, Conn.; John B. O'Reilly, and Joseph T. Lilly, of Norton, Lilly & Co., Bush Terminal Building, Brooklyn, head the company.

The plant of the National Saw Company, Middletown, N. Y., has been acquired by new owners, headed by Stanley Millspaugh. It consists of two and three-story buildings with about 50,000 sq. ft., and will be used for the production of new specialties.

A one-story power plant to cost about $25,000 will be erected at the factory of the L. A. Dreyfus Company, Maple Avenue, Rosebank, Staten Island, N. Y., manufacturer of rubber products.

The National Wire Wheel Company, Geneva, N. Y., has let contract for erection of a factory. Work has been started.

The Industrial Barge Corporation, Inwood, N. Y., has been incorporated to build boats and machinery. R. Narrelle, 390 Wadsworth Avenue, Bronx; W. J. Krauss, 300 Albany Avenue, and H. Hentze, 1832 Bath Avenue, Brooklyn, are the incorporators.

The Sheridan Iron Works, Champlain, N. Y., has completed plans for a one-story machine shop, 50 x 100 ft.

Westinghouse Church Kerr & Co., 37 Wall Street, New York, have been awarded the contract from the Buffalo, Rochester & Pittsburgh Railroad Company for machine and erecting shops, blacksmith shop, etc., to cost $500,000.

The Meldrum Motor Corporation, Buffalo, capitalized at $25,000, has been incorporated by A. S. Meldrum, J. F. Hattman and E. A. More, Main and St. Paul streets, to manufacture motors, engines, etc.

New England

BOSTON, MASS., June 11, 1917.

While there has been much activity during the week in the machine tool trade, it has followed along the same line as the trade of the past month—the sale of one or two machines of a kind to an unusually diverse list of purchasers. It is difficult to trace many machine tool sales to the activity in shipbuilding, although a fair proportion of the business is probably due indirectly to this source. Railroad business is reported very quiet. New England has secured a share in the recent large orders placed by the leading electrical interests, but other than this no large inquiries or orders have been reported. Prices of machine tools are for the moment stationary, but most other lines of machinery are constantly advancing. Except where immediate delivery can be made, most sales are now made at the price prevailing at the time of delivery.

The Bassick Company, Bridgeport, Conn., whose incorporation for $6,000,000 was noted last week, is a merger of the Burns & Bassick Company, Bridgeport, the M. B. Schenck Company, Meriden, and the Universal Caster & Foundry Company, Newark, N. J. The officers are Edgar W. Bassick, president; W. A. Schenck and W. R. Bassick, vice-presidents; F. C. Bassick, secretary; W. F. Burns, treasurer; C. H. Knapp, assistant treasurer; A. E. Belisle, assistant secretary.

The Arcade Malleable Iron Company, Worcester, Mass., is to build an addition, 75 x 150 ft., one story, to its foundry.

The Apco Mfg. Company, Providence, R. I., has been incorporated with authorized capital stock of $200,000, to manufacture automobile supplies. The incorporators are Thomas F. Wilson, 87 Columbia Avenue, Edgewood; and Daniel J. Healey and James E. Brothers, Providence.

The Warren F. Fraser Company, Boston, Mass., is to remove its business to the factory formerly occupied by the Novelty Weaving Company, Westboro, Mass. The company manufactures grinding machines.

The Gallison Brass Foundry, Lawrence, Mass., has been incorporated with authorized capital stock of $5,000. The directors are P. C. Wiggin, president; Frances B. Mowry, treasurer; and J. M. Gallison.

The American Steel & Wire Company has begun the erection of an addition, 41 x 42 ft., one story, to the power plant at its New Haven, Conn., works.

The Huff Machine Works, Boston, Mass., has been incorporated with authorized capital stock of $25,000. The directors are Edward T. Roche, president; George L. Colburn, 57 Equitable Building, Boston, treasurer; and William P. Everts.

The Chase Rolling Mill Company, Waterbury, Conn., has awarded a contract for a building, 67 x 82 ft., three stories.

The Middletown Fire Arms & Specialty Company, Middletown, Conn., has been incorporated with authorized capital stock of $50,000, $30,000 paid in. The incorporators are Dayton A. Baldwin and Fred F. Hodge of Middletown and Lucius N. Diehm of West Hartford.

The Bantam Ball Bearing Company, Bantam, Conn., has increased its capital stock from $100,000 to $250,000.

The Colt's Patent Fire Arms Company, Hartford, Conn., is to build a hardening building, 60 x 180 ft., one story.

The Taylor & Fenn Company, Hartford, Conn., has increased its capital stock from $200,000 to $250,000.

The Bridgeport Brass Company, Bridgeport, Conn., has awarded a contract for an addition, 67 x 70 ft., two stories.

The Novelty Electric Company, Litchfield, Conn., has been incorporated with capital stock of $2,000 to manufacture metal goods and electrical novelties. The incorporators are Raymond G. Stewart, Watertown; George R. Trumbull, Bantam; and Fred L. Garrigues, Waterbury.

The Culver-Stearns Mfg. Company, Worcester, Mass., has leased a new four-story building, containing 25,000 sq. ft. of floor space, on Hygeia Street. It will vacate its present quarters at 34 Southbridge Street. The company makes electrical equipment for automobiles.

The Package Machinery Company, Springfield, Mass., is to build an addition, 14 x 49 ft., three stories.

The Stanley Motor Carriage Company, Newton, Mass., which was incorporated in April under Delaware laws with authorized capital of $13,100,000, succeeds the former corporation of the same name, and capital stock to the amount of $2,500,000 has been issued and the company reorganized in preparation for manufacturing on a greatly increased scale. Prescott Warren, formerly vice-president, becomes president, succeeding F. E. Stanley; Edward M. Hallett, formerly secretary, is treasurer, succeeding F. O. Stanley; Carleton F. Stanley remains vice-president of manufacture; and Frank

Jay, Western manager, becomes vice-president of sales. Charles Counselman and Arthur L. Goodwillie, of the Chicago banking house of Counselman & Co. are directors, representing the new financial interests.

Philadelphia

PHILADELPHIA, PA., June 11, 1917.

The Continental Aircraft Company, Parkway Building, Philadelphia, is contemplating the construction of a plant on North Sixth Street, Camden, N. J., for the manufacture of aeroplanes and hydroplanes. Property about 150 x 230 ft. has been acquired for a two-story brick and concrete building. Donald Anderson is president.

The H. C. Gray Company, 1408 Mount Vernon Street, Philadelphia, has awarded a contract for the erection of a one-story machine shop, about 50 x 92 ft. at 1320-24 Mount Vernon Street to cost $15,000.

The Consolidated Motors Corporation, Philadelphia, has increased its capital from $1,500,000 to $2,500,000 for expansion.

Fire June 2 destroyed part of the plant of the Barrett Mfg. Company, Tucker and Bermuda streets, Philadelphia, manufacturer of roofing, with a loss estimated at $40,000.

The Pennsylvania Steel Export Company, Philadelphia, has increased its capital from $30,000 to $210,000 for extensions.

The Dural Rubber Company, Trenton, N. J., has been incorporated with a capital of $200,000 to establish a plant for the manufacture of automobile tubes, tires, etc. A site is now being selected. Newton A. K. Bugbee, Edward H. and Asher Wilson, John E. Gill and James C. Tattersall are the principal incorporators.

The Home Rubber Company, Trenton, N. J., manufacturer of mechanical rubber goods, has acquired property 50 x 100 ft., on Wolverton Avenue, adjoining its plant, for the erection of an addition.

The Johnson School, Richmond Hill, Scranton, Pa., has awarded a contract for the erection of a three-story brick shop building, 60 x 120 ft., to be equipped for industrial work.

The Lancaster Automatic Machine Company, Lancaster, Pa., has been incorporated in Delaware with a capital of $200,000 to manufacture automatic and non-automatic machinery. Edward B. Paul, S. Z. Moore, and Scott W. Baker are the incorporators.

The Industrial Foundry & Machine Company, Laurel and Washington streets, Pottstown, Pa., specializing in the manufacture of steam fitting supplies, etc., has completed the erection of its extension, about 50 x 135 ft., and is now occupying the building. George A. Mohn is president.

Fire, June 5, destroyed part of the plant of the Fleetwood Metal Body Company, near Reading, Pa., manufacturer of automobile bodies. The machine shop and plant of A. P. Merkel, Franklin Street, manufacturer of machinery and parts, adjacent to the Fleetwood works, was also destroyed. The total loss is estimated at $200,000.

The Bethlehem Steel Company, South Bethlehem, Pa., has taken bids for the construction of a four-story reinforced-concrete addition to its pattern plant, about 60 x 400 ft., to be erected at its Pennsylvania Steel Works, Steelton.

The Washington Mold, Machine & Foundry Company, Washington, Pa., has been incorporated with a capital stock of $25,000 to manufacture and repair machinery and molds. The incorporators are W. M. Crile, William J. Bromley and G. W. Hewing.

The Pierce, Packer & Supply Company, Franklin, Pa., has been incorporated with a capital stock of $100,000 to manufacture metal packing, fittings, supplies and appliances for oil and gas wells. The incorporators are Charles A. Pierce, William S. Pierce and Orrin D. Bleakley.

The Rumsey Electric Company, Philadelphia, has been incorporated with a capital stock of $325,000 to manufacture electrical appliances, machinery, etc. The incorporators are Eugene A. Rumsey, Fox Chase, Philadelphia; George A. Rumsey, Jr., Stenton, Mount Airy, Philadelphia; George A. Rumsey, Sr., Salem, N. J.; Charles H. Kelley, Haddonfield, N. J.; B. F. Hare, Germantown, Philadelphia, and George S. Trimble, 5903 Christian Street, Philadelphia.

The Shepherd-Rust Company, Wilkes-Barre, Pa., has been incorporated with a capital stock of $75,000 to manufacture lighting fixtures and supplies. The incorporators are George E. Shepherd, Dorranceton, Pa.; Harold N. Rust, Middletown, Pa., and others.

The Victor Talking Machine Company, Camden, N. J., is taking bids for the erection of an addition to its plant. Ballinger & Perrot, Philadelphia, are architects.

The Somers Shipbuilding Company, 209 North Missouri Avenue, Atlantic City, N. J., has been incorporated with a capital of $100,000. Warren Hubert and Samuel Somers are the incorporators.

The proposed addition to the plant of the Lambert & Todd Machine Company, 119 Arch Street, Camden, N. J., manufacturer of machinery, will be a one-story structure, instead of two stories, as previously announced, with foundations to provide for the erection of additional stories as required. The building will be L shape, 70 x 85 ft., and will cost about $25,000. It is expected to be ready for occupancy by August, and will be used to manufacture armor plate for motor car use for Government service.

The Carpenter Steel Company, 43 Exeter Street, Reading, Pa., has awarded a contract for the erection of a one-story addition, 50 x 75 ft., to be known as building No. 37.

Baltimore

BALTIMORE, MD., June 11, 1917.

The Locked Rail Spike Company, 2544 West Fairmount Avenue, Baltimore, has been incorporated with $100,000 capital stock. The incorporators are Howard W. Young, George J. Lippold and Roger S. Whiteford.

The Buck Glass Company, Fort Avenue and Lawrence Street, Baltimore, manufacturer of flint glass bottles, has purchased a 100 x 245-ft. piece of ground adjoining the present plant. No announcement of plans has been made. George G. Buck is president.

The Tredegar Company, Richmond, Va., will build an addition to its foundry, about 66 x 170 ft., to cost $30,000.

The Bureau of Yards and Docks, New York Avenue and Seventeenth Street, Washington, D. C., is taking bids until June 25 for the erection of a new machine shop at Thirtieth and P streets.

The Bureau of Yards and Docks, Washington, D. C., has taken bids for the erection of two shell, magazine and torpedo buildings, to be erected at St. Julians Creek, Va. The buildings will be brick and steel, three one-story, 50 x 198 ft., and one one-story, 50 x 155 ft.

The Newport News Shipbuilding & Dry Dock Company, Newport News, Va., has awarded a contract for the erection of a four-story brick addition, about 50 x 250 ft., to James Stewart & Co., 30 Church Street, New York. H. L. Ferguson is president.

Chicago

CHICAGO, ILL., June 11, 1917.

The machine-tool trade is optimistic, but it is generally admitted that the past week has been quiet, with less inquiry as well as fewer sales. Ii is apparent that buyers are in a state of uncertainty as to the effect which the war and consequent Governmental action will have upon their business. Not the least thing to be considered is the degree to which their requirements of raw materials will be circumscribed. Automobile makers have practically ceased buying, and in one or two cases have endeavored to cancel orders for machine tools, but there has not been enough of this to affect deliveries.

Some large war orders for equipment and materials other than machine tools have been placed in this district which ultimately will benefit all lines of trade. Rumors are heard that large contracts which will involve metal-working equipment will be placed at an early date, one report mentioning a large carbuilding company. Most of the Western shops are not equipped for munitions work, and should they receive such orders could not be ready for months unless the character of the contracts insured early delivery of tools. An exception is a large Milwaukee manufacturing company which has executed large contracts for foreign governments, and it is probable that this company will receive orders, if it has not done so already.

Some railroad business is pending, notably that of the Santa Fe and the Illinois Central. The Grand Trunk has purchased a few tools. The demand is chiefly for tools of the heavier types.

The Electric Steel Company, 3100 South Wood Street, Chicago, Ill., will erect a two-story brick foundry addition, 66 x 100 ft.

The Chicago Fuse Mfg. Company, Chicago, maker of electrical fuses, has purchased a plot, 119 x 150 ft., at Congress and Morgan streets, on which it will build a seven-story factory to cost about $170,000. Building may be deferred for a time because of the high cost of material.

The new plant of the Root & Van Dervoort Engineering Company, East Moline, Ill., to which reference has been previously made, will be 140 x 700 ft., and is to be finished

in 70 days. It will be of brick and timber, with a mezzanine floor the entire length of the building. The center bay, 40 ft. in width by 40 ft. in height, will enable cranes to give service, over the entire length of the building. The plant alone is to cost about $150,000. Machinery has been purchased.

The Lourie Mfg. Company, Springfield, Ill., has received an order from Russia for a large hydraulic wheel press. It has just shipped two large tire setters to that Government.

The Camden Foundry Company, Camden, Ark., whose plant was recently destroyed by fire has completed a new building of concrete and steel.

The Briegel & Hagius Mfg. Company, Davenport, Iowa, has awarded the contract for a shop, 50 x 100 ft., to cost about $15,000, at Rock Island, Ill. The company will supply tools, jigs and fixtures to the Root & Van Dervoort Mfg. Company, East Moline. The factory is to be finished in about 30 days.

The Peoria Machine & Supply Company, Peoria, Ill., has been incorporated at Springfield, Ill., with a capital stock of $15,000 to manufacture and repair machinery. Among the incorporators are William I. Aitken and Roscoe Herget.

The Forest City Bit & Tool Company, Rockford, Ill., John A. Anderson, president, and Fred Peterson, secretary, has increased its capital stock from $25,000 to $100,000.

The Quaker Oats Company, Cedar Rapids, Iowa, will expend about $1,000,000 in improvements to its buildings and machinery.

J. Harry Theobald, Egington, and G. K. Franklin, Chicago, have incorporated in Delaware the Great American Truck & Tractor Company, with capital of $250,000.

The National Electric Vending Company, Chicago, has been incorporated in Delaware with a capital of $500,000 to manufacture automatic vending machines. Leonard L. and B. F. Cowan, and R. Montgomery, Chicago, are the incorporators.

The Murphy Mfg. Company, Peoria, Ill., has been incorporated in Delaware with a capital of $150,000 to manufacture a hinge hasp lock. Otto S. Murphy, Peoria; Fay Lewis, Rockford, and A. M. Melvin, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, WIS., June 11, 1917.

Orders for machine tools continue to be placed with local makers on a comparatively large scale, although the recent demand has not been as brisk as in the preceding months. Tool builders, however, have not been able to make any appreciable headway in deliveries, and quotations are still 90 to 120 days ahead. The machine-tool trade gives evidence of much uncertainty pending the program of the Government. Private requirements, however, are being placed right along, principally for single tools.

The labor situation, while not entirely favorable because of the short supply, is regarded as fairly satisfactory. The Milwaukee Free Employment Bureau reports that applications for jobs in May exceeded by 900 the same month of 1916, and were 800 greater than April, 1917.

The Spring City Foundry Company, Waukesha, Wis., maker of grey iron castings, has awarded a contract for the erection of a steel and brick foundry addition, 80 x 140 ft. Work is now under way.

The Beloit Burr Mfg. Company, Beloit, Wis., has awarded contracts for a two-story brick and concrete factory addition, 40 x 90 ft., to cost $15,000.

C. F. Dallman, Antigo, Wis., has plans for a brick and concrete machine and repair shop, 72 x 82 ft., one story, at Fifth Avenue and Field Street.

The Lawson Aircraft Company, Green Bay, Wis., organized by Alfred W. Lawson, Detroit, Mich., to manufacture airplanes and parts, is completing the equipment of the first unit of its plant, affording 8000 sq. ft. for immediate use. In addition, the company will equip four leased buildings, consisting of two machine shops and two wood-working shops, which eventually will employ 1000 operatives. Lawrence Allison, formerly of the Curtiss, Burgess and Standard companies, is chief engineer. John Carisi, Brooklyn, N. Y., is factory superintendent, and Lee Wallace, recently with the Curtiss interests, is designer.

The Allis-Chalmers Mfg. Company, Milwaukee, has purchased eight lots adjoining its main works at West Allis. The property was purchased, it is stated, in case the tract should be required for future extensions.

The Jacobsen & Austin Auto Company, 207 East Washington Avenue, Madison, Wis., has engaged James R. Law, architect, to prepare plans for a four-story garage and repair shop, 83 x 113 ft., costing $50,000.

It is reported that the Ackerman Wheel Company, Cleveland, Ohio, is establishing an airplane assembling plant in Duluth, Minn., which will be completed about July 15 or Aug. 1. It is also stated that the company contemplates the erection of a manufacturing plant at a cost of $200,000 at the twin ports.

The Giant Grip Company, Oshkosh, Wis., has been organized by W. H. Krug and Otto Kaufmann to manufacture an anti-skid chain and clamp for motor trucks. For the present it will be made by the Challoner Company, founder and machinist, Oshkosh.

The Stika-Chapek Iron Works, Algoma, Wis., has completed the installation of a new furnace and took off the first heat on June 4. It will now make its own castings for its line of farm machinery and gasoline engines.

The Universal Machinery Company, 784 Thirtieth Street, Milwaukee, has increased its capital stock from $75,000 to $100,000 to accommodate the growth of its business. E. C. Devlin is president.

The Wisconsin Bridge & Iron Company, North Milwaukee, Wis., has awarded contracts for a one-story addition, 30 x 100 ft., to the Robert L. Reisinger Company.

The Chicago & North-Western Railroad Company is building a 35-stall roundhouse, with a steam power plant, at the Chase yards, near the south limits of Milwaukee. The work will cost about $350,000. W. H. Finley, Chicago, is chief engineer.

The Two Rivers Plating Works, Two Rivers, Wis., has completed the erection of a shop addition and is installing additional equipment for plating and re-tinning aluminum and other castings. The capacity will be doubled.

The Manitowoc Seating Company, Manitowoc, Wis., has been organized by Thomas E. Torrison, Emil Baensch, J. G. Lehmkuhl and Charles Spindler and will erect a factory for the manufacture of desks, chairs, etc. About $50,000 will be expended for the building and equipment.

Cleveland

CLEVELAND, OHIO, June 11, 1917.

Round-lot inquiries for machines are lacking and the trade is still marking time awaiting Government orders. An increased demand is noted, however, for single tools and small lots in large sizes for Government work, which include lathes, planing, drilling, milling, punching and shearing machines. The Lake shipbuilding industry is in the market for large tools, inquiries having come out for a number of machines from the American Shipbuilding Company and the Port Arthur Shipbuilding Company. Government demand on the motor truck manufacturers is reflected by an order for six 42-in. boring mills placed by the West Steel Casting Company, Cleveland, for machining steel truck wheels.

The Peerless Motor Car Company, Cleveland, has completed extensions to be used for the manufacture of pleasure cars, and has commenced the erection of a warehouse, 48 x 400 ft. It will shortly require a 750-hp. boiler. The motor truck department of the company is employed to about its full capacity in trucks for England at the rate of 15 a day, and it is expected that these orders will keep it busy for an indefinite time.

The Templar Motors Corporation, Cleveland, has commenced the erection of a one-story building, which will be the first unit of its plant. The manufacture of motor cars will begin in about 30 days. M. F. Bramley is president.

The Winton Engine Company, Cleveland, has commenced the erection of a one-story brick addition, 99 x 358 ft.

The F-R-X Mfg. Company, Akron, Ohio, has been incorporated with a capital stock of $150,000 by W. M. Graham, James Heller, C. A. Hill and others to manufacture fire extinguishers.

The Acme Tool Company, Toledo, Ohio, maker of tools, dies and jigs, has moved to new quarters, 500 South St. Clair Street, where six times its former manufacturing space is provided. New equipment is being installed and the company plans to double its output.

The Hydro-Carbon Wickless Burner Company Canton, Ohio, has been incorporated with a capital stock of $50,000 by James E. Kinnison, William K. Schultz and others, and contemplates the erection of a plant for the manufacture of burners.

The Wise-McClung Mfg. Company, New Philadelphia, Ohio, which has been incorporated with a capital stock of $200,000 for the manufacture of electric vacuum sweepers, will erect an addition providing 6000 sq. ft. of floor space to the foundry of the Rath Aluminum Company, which it has taken over. W. A. Wise is president and general manager; W. A. McClung, vice-president, and Ivor Harris, secretary and treasurer.

The American Reduction & Chemical Company, Bellaire, Ohio, has been incorporated with a capital stock of $50,000 by J. A. Greenfield and others, and plans to erect a factory in New Mexico for reducing metals and manufacturing chemicals.

The Truck Attachment Company, Seattle, Wash., has acquired 18,000 sq. ft. of floor space on West Eleventh Street, Cleveland, formerly occupied by the Carey Company, for a manufacturing plant.

The Quickwork Company, maker of sheet metal working machinery, which recently removed its plant from Detroit to St. Marys, Ohio, will remove its offices to St. Marys in a few days and enlarge its manufacturing facilities.

The Ohio Machine Tool Company, Kenton, Ohio, which is now erecting an addition to its planer department, has had plans prepared for a further extension providing 2500 sq. ft. of floor space for tool room purposes.

The Cleveland Fare Box Company, Cleveland, will erect a new plant on East Fifty-fifth Street, near Lexington Avenue. The contract has been placed.

The Bay View Foundry Company, Sandusky, Ohio, is building an addition to its plant, 60 x 120 ft., one story, to be used as a cleaning department.

Detroit

DETROIT, MICH., June 11, 1917.

The machine-tool market remains slow. No large orders were placed last week, and miscellaneous lots failed to bring the sales up to normal. Manufacturers are keeping their plants working to capacity in most cases, only a few temporary lay-offs being reported. Labor conditions are satisfactory, with a great demand for skilled workmen and high wages. Deliveries on machine tools have not changed materially although lathes are more easily obtainable. Milling and other special machines are said to require up to a year for delivery.

The Armored Motor Company, Detroit, has been incorporated with a capital stock of $100,000 by W. A. Ross, A. Lester Mancourt and Webb C. Artz.

It is reported that the General Motors Company has taken over the plant of the Sampson Truck Works, Stockton, Cal., for the manufacture of tractors. It is expected that by the first of November from 40 to 60 tractors a day will be turned out.

The Cadillac Auto Truck Company, Cadillac, Mich., manufacturer of the Acme truck, has increased its capital from $200,000 to $330,000.

The Porter Mfg. Company, Ann Arbor, Mich., is remodeling the plant of the Ann Arbor Furniture Company, which it has leased for a number of years.

The Fuller & Sons Mfg. Company, Kalamazoo, Mich., manufacturer of transmissions, report all production records broken the first five months of this year. The output was two and one-half times that for the same period of 1916. New plants are being erected which will be ready for occupancy this summer. W. P. Fuller is secretary.

The Differential Lock Company, Grand Rapids, Mich., is having plans drawn for a three-story factory, 50 x 200 ft.

The Ecorse Foundry & Machine Company, Ecorse, Mich., has completed this week a new plant for the manufacture of light gray iron castings. Equipment has been installed to melt 100 tons of iron a day. The production will be confined to machine molded castings. The officers are B. F. Everitt, president; W. A. C. Miller, vice-president, and A. J. Kinnucan, treasurer and general manager.

Indianapolis

INDIANAPOLIS, IND., June 11, 1917.

The Dakin Emergency Safety Brake Company, Indianapolis, has been incorporated with $50,000 capital stock to manufacture safety brakes and other devices. The directors are G. E. Dakin, M. A. Dakin and Samuel Dakin, all of Stanton, Mich.

The Vanyo Lock Company, Indianapolis, has been incorporated with $30,000 capital stock to manufacture car doors, locks and machinery. The directors are Joseph, Andrew and Joseph T. Vanyo, all of Warren, Minn.

The A. J. Mayer Mfg. Company, Indianapolis, has been incorporated with $20,000 capital stock to manufacture nut-locks and machinery. The directors are A. J. and Reginald J. Mayer and E. K. Braun, all of Genesee, Idaho.

The Lederer & Coughlin Mfg. Company, South Bend, Ind., has been incorporated with $15,000 capital stock to manufacture vending machines. The directors are Herbert J. Lederer, John Q. Johnson and James P. Coughlin.

The J. A. Glanton Furniture Company, Columbus, Ind., has been incorporated with $60,000 capital stock to manufacture furniture. The directors are James A. Glanton, Clarence C. McCollough and John W. Kelley.

The Crow-Elkhart Motor Company, Elkhart, Ind., has bought a 26-acre tract adjoining its factory, six acres of which will be used for plant extensions and the remainder as sites for homes for its employees.

Options have been taken on 194 acres of land near Bloomington, Ind., as a site for a cement plant to be built by Adam Beck, Ada, Okla., at a cost of $200,000.

The Swartz Electric Company, Indianapolis, has increased its capital stock from $150,000 to $1,000,000.

The Bockstege Furniture Company, Evansville, Ind., has increased its capital stock from $120,000 to $195,000.

The Hoosier Sub Carburetor Company, Indianapolis, has increased its capital stock from $25,000 to $100,000.

Plans are being drawn for the Lampson Motor Truck & Tractor Company, Chicago, for a plant at Elkhart, Ind. The investment will be about $1,500,000 and the number of employees 500.

Cincinnati

CINCINNATI, OHIO, June 11, 1917.

Circulated reports that several local firms are working on Government contracts for munitions are not correct. It is true, however, that many machines are under way for firms who have been awarded contracts. A number of plants at Dayton, Ohio, are busy on Government work, and it is rumored that three or four firms at Columbus, Ohio, have recently been awarded munitions contracts.

Deliveries on lathes can now be made more promptly than at any time since the war rush began. There are a large number of inquiries out for different kinds of machine tools but they are slow in developing into orders. Second-hand machines are now a little easier to obtain, but fancy prices still rule on all rebuilt machinery. The demand for saw-mill machinery continues very good. Small and medium-sized electric generators and motors are also in good demand, and it is difficult to obtain prompt delivery on certain sizes.

The labor situation is unchanged. The foundry at Hamilton, Ohio, whose molders are on a strike, is still idle.

The Morris Machine Tool Company, Cincinnati, is adding to its shop equipment a sufficient number of machine tools to materially increase its present capacity. A. C. Pletz is general manager.

The Mal-Gra Castings Company has removed its sales office from Cincinnati to Middletown, Ohio. The company advises that it will not remove its foundry from Cambridge City, Ind., to Middletown, as has been reported. It is now adding considerable equipment to its plant at Cambridge City.

The United States Can Company, Cincinnati, confirms the report that it will build a branch plant on Menard Avenue, Chicago, Ill.

The Willard Machine Tool Company, Cincinnati, has been incorporated with $100,000 capital stock by George A. Willard and others. It will continue the operation of the plant in Covington, Ky., heretofore operated under a partnership arrangement.

The Dayton Pump & Mfg. Company, Dayton, Ohio, has increased its capital stock from $180,000 to $1,000,000 to take care of its increasing business. No new building additions are contemplated in the immediate future.

The French & Hecht Company, Springfield, Ohio, has awarded a contract for an addition to its plant, 100 x 150 ft., one story. It will be used mostly for storage purposes, but the company will install considerable machinery in its main plant to increase its output of tractor wheels.

The Superior Gas Engine Company, Springfield, Ohio, is preparing to erect two additions, for storage purposes, to its plant, approximately 40 x 80 ft., one story.

The Buffalo-Springfield Road Roller Company, Springfield, Ohio, has let a contract for a brick addition. Building details are not yet available.

The Kilgour Mfg. Company, Columbus, Ohio, has been incorporated with $100,000 capital stock by Henry Gumble, E. F. Hoover and others. It operates a plant at Homestead, Pa., for the manufacture of toy cannon, toy pistols, etc. This plant will be removed to Columbus at an early date. A small foundry is operated in connection with the plant which will occupy the building formerly used by the Columbus Plow Company.

The Hayden-Corbett Chain Company, Columbus, Ohio, will erect a branch plant at Huntington, W. Va., 40 x 650 ft., one story. It has not yet decided what machinery will be required further than a number of electric motors and a quantity of shafting.

The Central South

LOUISVILLE, KY., June 11, 1917.

Many orders received by local manufacturers and distributors are from plants working on Government contracts. Electrically driven hand tools are in good demand and material of any kind is snapped up regardless of price. Motors and generators continue in active call. Inquiries in all lines are somewhat restricted to items of necessity. Government work is given the preference with the result that a number of local consumers of iron and steel are in need of supplies. South of the Ohio River coal prices and the supply are more favorable due to intermittent embargoes on northbound traffic.

The Vogt Brothers Mfg. Company, Louisville, has increased its capital from $50,000 to $250,000 and is pushing construction work on its new plant at Sixteenth and Rowan street, which will be completed in about four months. It is now prepared to handle heavy castings up to 25,000 lb.

The Improved Windshield Mfg. Company, Louisville, has been incorporated with a capital stock of $30,000 by W. R. Shacklette, J. Bauer and D. T. Duckwall, Jr.

The Scheffel Lumber Company, Louisville, Ky., has increased its capital from $30,000 to $100,000.

The John G. Duncan Company, Knoxville, Tenn., is asking for lowest dealers' prices on a 30 to 40-hp. locomotive boiler of 100 lb. pressure, mounted on wheels. One wood or steel stiff leg derrick, capacity 50 tons, lift 50 ft., together with necessary swing engine, to be operated by air or steam.

The San Juan Timber Company, Nashville, Tenn., with a capital stock of $175,000, has been incorporated by M. P. O'Connor, Littell J. Rust, W. A. Webster, Lee Brock and R. R. C. Howell.

St. Louis

ST. LOUIS, MO., June 11, 1917.

The machine tool market remains quiet. While a condition of marking time prevails in the call for new equipment, that already installed continues to be operated to the maximum.

G. N. Lasswell and C. L. Coble, Kennett, Mo., will build an electric light plant at Bernie, Mo., and are in the market for machinery.

The Guady Playthings Company, Kansas City, Mo., has increased its capital from $50,000 to $75,000 to extend its manufacturing equipment.

The Walnut Ridge Hoxie Compress Company, Walnut Ridge, Ark., has been incorporated with a capital stock of $50,000 by S. C. and W. A. Dowell, S. E. Spikes, J. G. Richardson and others and will equip a compress with a daily capacity of 10,000 bales.

An electric light and power plant will be equipped at Paris, Ark., with W. N. Gladson, Fayetteville, Ark., engineer in charge. Bids are being received for two 100-hp. boilers, one 200-hp. open-feed water heater, two feed water pumps, one 140-hp. engine, one 120-kva. 60-cycle engine type alternator and other equipment.

Malvern, Ark., G. E. Matteson, chairman of the improvement, district, will equip waterworks plant at a cost of about $75,000.

The Leahy-O'Brien Boiler Company, Jennings, Okla., has been incorporated with a capital stock of $10,000 by George O'Brien, F. B. Berdenkecher and Richard Leahy to manufacture boilers.

Ada, Okla., will improve its waterworks plant at a cost of about $50,000 and construct a flume for the installation of water power machinery.

Red Fork, Okla., W. E. Kerr, clerk, will equip a waterworks plant, including a gas engine, pump, etc., the machinery to cost about $20,000.

The Oklahoma Power & Transmission Company, W. H. Zimmerman, Ada, Okla., in charge, will develop plants of between 7000 and 10,000 kw. capacity. Two 4500 kw. steam turbines, 12 boilers, gas burners for the boilers and all necessary equipment will be installed. Sinclair Mainland, Chicago, Ill., is president.

Fayette, Miss., has voted $17,000 for the installation of a municipal electric plant.

Meridian, Miss., has voted $75,000 for the equipment of a municipal ice-making and cold storage plant.

The Harris-Brooks Lumber Company, Meridian, Miss., has been incorporated with a capital stock of $50,000 by C. K. Brooks and others.

The Terry Shipbuilding Company, Moss Point, Miss., Edward F. Terry and George H. Britain of New York, stockholders, will equip a shipbuilding plant with facilities for 20 vessels of 3500 tons each.

The Yazoo & Mississippi Valley Railroad Company will equip a round house, machine shop, etc., at Baton Rouge, La. About $150,000 will be expended.

The Inland Machine Works, St. Louis, has purchased five acres of land and will soon begin the erection of a two-story building, 70 x 430 ft., with four wings, each 70 x 400 ft.

Texas

AUSTIN, TEX., June 9, 1917.

A falling off in the number of new industrial incorporations has been noted the past week. The machine tool trade, however, continues satisfactory. Crop conditions have deteriorated, due to the lack of rain in most parts of the State.

The Columbus Electric Light Company, Columbus, has leased the municipal waterworks plant and will add machinery and enlarge the pumping facilities.

The De Leon Compress & Warehouse Company, De Leon, will build a cotton compress at a cost of about $40,000. William B. Starr is a stockholder.

California

SAN FRANCISCO, CAL., June 5, 1917.

While the demand for machinery is still good, an easing off has been noted in installations of large sized machines and a general disposition to await the Government's demands. Shipbuilding and lumbering are the big features, but definite developments in these industries are a little slow in coming through, although the lumber mills are in the market for machinery most of the time. Garage and automobile repair shop equipment is in active demand.

The Union Iron Works, San Francisco, will erect a new machine shop, 185 x 600 ft., for building turbine engines. Its shipbuilding plant at Alameda is also to be increased by the addition of pattern and fitting out shops.

The Benicia Shipbuilding Company, San Francisco, has been incorporated with a capital stock of $500,000 by H. R. White, Roland C. Forester, R. L. McWilliams and Howard Finn.

The machine and repair shop of Peterson, Gage & Real, Sacramento, was burned last week with a loss of about $12,000.

The Monarch Foundry Company, Stockton, will erect a machine shop, 101 x 151½ ft., in connection with its foundry.

The Los Angeles Shipping & Drydock Company, Los Angeles, will erect four ways, each 60 x 500 ft., a wharf of the same length and an aerial tramway.

The A. J. Savage Munitions Company has announced plans for the erection of factory at San Diego for the manufacture of shotguns, rifles and machine guns. Approximately $35,000 will be expended for buildings and $165,000 for equipment.

T. H. Tracy, San Diego, has purchased a site of 20 acres on the San Diego water front and has organized the Tracy Engineering & Shipbuilding Company. A shipbuilding plant will be erected.

The Crown Sash, Door & Mill Company, Los Angeles, has been incorporated with a capital stock of $20,000 by G. F. Hopkins, C. R. Blankenship and E. G. Carter.

The Hammond Lumber Company, Eureka, is preparing to put in a four-way shipbuilding plant at Samoa. Special sawmill machinery and several self-propelling cranes will be installed.

The Commercial Car Construction Company, Sacramento, has been organized by S. D. Rogers and others to manufacture a new type of motor car.

The Collins Steel Studding Company, San Francisco, has been incorporated with a capital stock of $100,000 by C. Collins, G. E. Sanford, M. C. Feddersen, M. L. Cowin and J. C. Flannery to manufacture metal studding, channels, clips, lathes, etc.

The temporary shop building to be erected by the Pacific Electric Railway Company, Pacific Electric Building, Los Angeles, at the site of new permanent works at Torrence, will be about 75 x 220 ft., and equipped for the construction of freight cars. M. C. Halsey is superintendent of construction.

The A-R Products Company, Huntington Park, near Los Angeles, has been incorporated with a capital of $150,000 to operate a foundry for the production of castings. Theodore N., E. B. and H. E. Rogers and P. M. Mosher, all of Huntington Park, are the incorporators.

The Whiting-Mead Commercial Company, 415 East Ninth Street, Los Angeles, will erect a one-story factory, about 100 x 210 ft., at Alameda Street and Vernon Avenue, for the manufacture of sanitary enamel and iron ware. It has an adjoining site of about 10 acres to provide for extensions. The initial plant with equipment will cost about $50,000.

J. Burris Mitchell, Los Angeles, has applied to the City Council, San Diego, for lease of property on San Diego Bay, with frontage of about 1600 ft., for the construction of a shipbuilding plant. It is said that the initial buildings will cost about $300,000, and machinery and equipment, $250,000. Leo Fighorea, marine engineer, Los Angeles, is the architect.

C. F. Christian, Central Mortgage Building, San Diego, is organizing a company with capital of $100,000 to establish a plant at Adams and Forty-first streets for the manufacture of automobile specialties and hardware. W. F. Freiden is also interested.

It is reported that the Spreckels Sugar Company, San Francisco, has awarded a contract to the Dyer Brothers Construction Company, Cleveland, Ohio, for the erection of a three-story mill and refining plant at Manteca, Cal., to cost $950,000.

The Pacific Northwest

SEATTLE, WASH., June 5, 1917.

The demand for farming machinery and equipment is unparalleled in this section. Fearing a labor shortage at harvest time, farmers are seeking labor-saving machinery, the call for which is greater than the available supply.

The Meacham & Babcock Shipbuilding Company, Seattle, has been incorporated for $300,000 and plans the construction of a plant on Salmon Bay for building wooden hulls. The incorporators are W. M. Meacham, H. G. Babcock, L. E. Meacham, Otto A. Case, James E. Bradford and H. R. Clise. Four ways with space for two more will be built at once. A contract for four ships has been taken.

The Washington Shipping Corporation, Seattle, has contracts for the construction of six 2600-ton auxiliary power wooden hull ships for the French Government, to be equipped with semi-Diesel engines, and to cost more than $2,000,000. The company will at once lay two new ways, giving an immediate capacity of six ships. Three vessels now under construction at its Harbor Island plant will be taken over by the French Government.

The Pacific Shipbuilding Company, Ltd., Vancouver, B. C., has been incorporated for $50,000 by J. C. Shields and J. T. Robinson. A site has been acquired on Fraser River, and construction of wooden vessels will begin at once.

The Rhodes Harvester Company, Spokane, Wash., plans the erection of a new foundry, enlargement of its main factory and installation of new machinery and an increase of 100 per cent in its working force.

The Ballin Watertube Boiler Company, Portland, Ore., has closed contracts for the construction of 40 marine boilers to cost $800,000. It will immediately erect a boiler manufacturing plant in Portland to employ 200 men.

Russell Winslow, Marshfield, Ore., representing San Francisco and Eastern capital, will immediately construct a shipyard on Coos Bay, to be in operation within 40 days. Work on four vessels will begin as soon as the ways are ready.

The Puget Sound Traction Light & Power Company, Stuart Building, Seattle, will build a 23,000 hp. unit to its hydroelectric power plant at Dieringer, Wash., to cost $750,000.

Grant Smith & Co., Porter Brothers, and Guthrie & McDougal, contractors, Portland, Ore., will co-operate in the establishment of a shipyard in Portland. The plant of the St. Johns Shipbuilding Company has been purchased, and eight ways will be added immediately. Government work only will be undertaken.

The Quartermaster Harbor Shipbuilding & Dry Dock Company, Tacoma, Wash., has been incorporated by Fred C. Robertson, Frank McCandless, Julius Zittel, J. G. Culliton and J. C. White for the establishment of a wooden shipbuilding plant.

The Pacific Shipbuilding Corporation, Seattle, has been organized by David Hollywood, Hans Pederson, C. E. Stuart and George Olson. The plant to be constructed will have six slips. Keels for six vessels for the Government will be laid within 60 days.

The National Home Building Company, manufacturer of knockdown houses, Vancouver, Wash., plans to immediately double the capacity of its plant by an addition 40 x 120 ft. and the installation of new machinery.

McKinney Brothers, boat builders, Seattle, are establishing a plant on Lake Union, to build boats up to 115 ft. long and do general repair work.

The Wheeler-Osgood Company, Tacoma, Wash., plans to equip its sawmill with motor-driven machinery and increase its daily capacity from 150,000 to 170,000 ft. Four 400 hp. turbines, three boilers, one generator, and one turbine will be installed. The improvements will cost $60,000.

Canada

TORONTO, ONT., June 11, 1917.

A committee representing the Vancouver Board of Trade, headed by Nichol Thompson, recently visited Ottawa and asked the Government for assistance in starting a $5,000,000 to $10,000,000 steel shipbuilding industry on the Pacific Coast. "We are building steel ships now both at Vancouver and Victoria, B. C.," said Mr. Thompson, "but we are dependent on our neighbors to the South for our steel. We want an iron and steel plant especially fitted up for turning out all the steel and iron parts used in the building of steel ships. The plant is all we need. We recognize that the demand for wooden ships is temporary, and we are now trying to make provision for steel shipbuilding which will be permanent."

It has been announced that of the 24 wooden ship contracts to be let by the Imperial Munitions Board of Victoria, B. C., 5 will go to New Westminster, 8 to Vancouver and 11 will be built on Vancouver Island. The Foundation Company, Ltd., has been authorized by the Munitions Board to construct a shipbuilding plant at Victoria, and has received contracts for a number of wooden vessels of the steam-propelled type. A site has been selected and construction will go ahead promptly.

Calgary, Alberta, proposes to improve its waterworks system at a cost of $100,000. G. W. Craig is engineer.

F. Neil Brodie, 42 Princess Street, St. John, N. B., will receive bids for one 20 kw., 220 volt direct current generator; one 30 kw. 110 volt generator, one 10 hp. motor; one 70 hp. steam engine; three 125 hp. boilers and one blower, 22,000 ft. per minute for the General Hospital.

Bids are being received by Swift Current, Sask., until June 19, for one motor driven centrifugal pump, with a capacity of 800 Imperial gal. per min. against a 300-ft. head. George D. Arnott is clerk.

Bids will be called at once for the erection of a dry-kiln and molding shop for the Elmira Transmission & Machinery Company, Elmira, Ont. E. Vice is manager.

The Colonial Fertilizer Company, Water Street, Windsor, N. S., will build an addition to its plant estimated to cost $30,000.

The Stewart Sheaf Loader Company, Ltd., 470 Martin Avenue, Winnipeg, manufacturer of agricultural implements, etc., will build a new factory. J. S. Menzies is manager.

The Ottawa Car Company, Slater Street, Ottawa, Ont., has let contracts for the erection of a repair shop to cost $60,000.

N. M. Loney, engineer, care the American Can Company, 120 Broadway, New York City, is asking for prices on two 150 hp., 150 lb. pressure internal-fire boilers for delivery at Maisonneuve, Que.

The Phonola Company of Canada, Ltd., Kitchener, Ont., has been incorporated with a capital stock of $250,000 by Arthur B. Pollock, Alexander H. Welker, Edwin W. Clement and others to manufacture musical instruments, victrolas, talking machines, etc.

The Kinleith Paper Mills, Ltd., St. Catharines, Ont., has been incorporated with a capital stock of $400,000 by William Bain, 25 King Street West, Toronto; Robert Gowan, Arthur C. Simonds and others to manufacture pulp, paper, etc.

The Wye Lumber Company, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by John I. Suteliffe, 34 Tyndall Avenue; Horace L. Brittain, 16 Pine Hill Road; Elenora S. Mathews and others to manufacture lumber, wood, etc.

The Rein Drive Tractors, Ltd., Toronto, has been incorporated with a capital stock of $5,000,000 by Harry M. Tandy, John W. F. Kerr, 39 Castlefield Avenue; William A. MacFarlane and others to take over the business of the Canadian Rein Drive Tractor Company, to manufacture tractors, machinery tools, implements, etc.

The Three Rivers Casting Company, Three Rivers, Que., will build a brick foundry at a cost of $35,000 and will be in the market for foundry equipment, lathes, etc.

The National Machinery Company, 72 Wellington Street West, Hamilton, Ont., will build a plant.

The National Paper Goods Company, Queen Street North, Hamilton, will build an addition to its factory to cost $10,000.

The Fir Tree Lumber Company, Fraser Valley, Dennison Road, B. C., will build an electrically operated sawmill to cost $60,000.

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